JUL 21 1943

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SATURDAY JUNE 19 1943

TABLE OF CONTENTS

Principles of Exercise Therapy E. A. NICOLL, F.R.C.S.Ed. 747

Jaundice following Administration of Human Blood Products
H. V. MORGAN, M.B., and D. A. J. WILLIAMSON, M.B. 750

Subcutaneous Ligature of Varicose Veins B. W. GOLDSTONE, F.R.C.S.Ed. 753

Post-operative Respiratory Complications in Service Cases
H. M. BIRD, M.R.C.S., S. D. KILNER, M.D., and D. J. MARTIN, F.R.C.S.Ed. 754

Caustic Soda Burns: Prevention and Treatment H. TERRY, M.B. 756

MEDICAL MEMORANDA

Treatment of Respirator Dermatitis. E. C. JONES, M.B. 757

GENERAL ARTICLES AND NEWS

Supply of Water to Rabbits and Guinea-pigs. E. L. KENNAWAY, M.D., F.R.S. 760
Resuscitation by Rocking. N. HOWARD MUMMERY, M.D. 759
REHABILITATION CENTRE FOR SCOTTISH MINERS 760
THE SERVICES 772
UNIVERSITIES AND COLLEGES 772
MEDICAL NOTES IN PARLIAMENT 773
MEDICAL NEWS 775

REPORTS OF SOCIETIES

NUTRITION SOCIETY:
Nutritional Problems of Infancy ...765

LETTERS AND ANSWERS

Keeping A.P.T. Cool and Upright—Site for Intramuscular Injection—Analysis of a Hair Preparation—Hypopituitarism, Hypogonadism, Anaemia — Treatment of Leucodermia—Horner's Syndrome after Birth—Management of Sterile Partners—Sterility and Contraception—Contaminated Injection—Tetanus.....775–6

Epidemiology Section.....774

LEADING ARTICLES

Labour and State Medicine.....761
Infectious Diseases and Social Conditions 762

ANNOTATIONS

Treatment of Tuberculous Cavities ...763
Skin Reaction to Phenobarbital 763
Determination of Blood Groups 764
A County Borough in the Front Line.....764

REVIEWS

Digestive Complaints 758
Forensic Blood Grouping 758
Maxillo-facial Injuries 758
School Health in New York City 758
Notes on Books 759

OBITUARY

Archibald Simpson, F.R.C.S.Ed. 771
A. G. McKendrick, F.R.C.P.Ed. 771
Olaf Scheel, M.D. 772

SUPPLEMENT

G.M.C.: Disciplinary Inquiries (*concluded*) *73*
MEDICAL WAR RELIEF FUND *74*
CORRESPONDENCE *74*
ASSOCIATION INTELLIGENCE *74*
POSTGRADUATE NEWS *74*

CORRESPONDENCE

The Cult of Negative Health. R. E. LUCAS, M.B. 766
Medicine and Politics. SOMERVILLE HASTINGS, F.R.C.S.; J. H. HUMPHREY, M.B.; B. C. THOMPSON, M.D. 766
State Subsidy for Medical Education. G. H. H. BOOTH, M.B. 767
Selection of Medical Students. J. C. L. DAY, L.R.C.P.I. 767
The Raw Milk Danger. JOYCE MCCARTHY, M.R.C.S. 767
Aspirin and Gastric Haemorrhage. Sir ARTHUR HURST, D.M. 768
Shortened Puerperium. MARY KIDD, M.B.; MYRTLE HUTCHINS, M.R.C.S....768
Sterility. JOAN MALLESON, M.B. 769
Adder Bite. T. M. DAVIE, B.M. 769
Phage for Dysentery. E. N. RUSSELL, M.D. 769
Union of Fractures. R. LARKIN, M.D. 769
Mass Radiography and Phthisis. Z. P. FERNANDEZ, M.D. 770
Treatment of Malaria. ALEC WINGFIELD, M.D. 770
Dose of Atebrin in Malaria. R. W. STEPHENSON, M.R.C.S. 770
Vaccination in India. J. A. LEWIS, M.B. 770
Sir Arthur Newsholme and Russian Medicine. P. D'ARCY HART, M.D....771
Feeding the World's Population. B. DUNLOP, M.B. 771
Arsenical Encephalopathy. A. O. F. ROSS, M.D. 771

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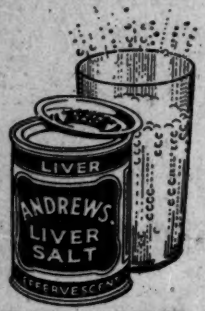

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23A

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 19 1943

PRINCIPLES OF EXERCISE THERAPY

BY

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Remedial exercises have long been recognized as the basis of functional recovery in fractures and other injuries of the locomotor system. In fact, the success of any accident service depends very largely on its organization for the application of therapeutic exercise to all cases and at all stages. In nearly all prolonged or serious illness, however, both medical and surgical, and non-traumatic as well as traumatic, there is a general deterioration of the locomotor system, and this is the chief cause of incapacity during the convalescent stage. In the past, convalescence from these conditions has been entirely negative and loosely supervised, but efforts are now being made by the Ministry of Health to substitute a more positive approach on the lines of the after-care organization in accident services. This, it is hoped, will be brought about by the more extended use of therapeutic exercise, on both a prophylactic and a curative basis. It should be a relatively easy proposition if the right type of organization can be evolved, because it is well known that deterioration of the locomotor system through simple disuse or toxaemia is much easier to cure than the same deterioration following trauma.

Two conditions, however, are essential to success. First, organization is necessary. The benefits of exercise therapy must be brought to all cases at the right time, in the right dosage, and in the appropriate form. Secondly, the physicians and surgeons themselves must appreciate and understand the basic principles of exercise therapy; for only then can they be expected to direct its application and to supervise intelligently the work of their technical assistants—the physiotherapist, the occupational therapist, and the gymnast. It is a defect in medical education that there is practically no teaching in this important branch of therapy, and even our most up-to-date textbooks do little more than advise us to use it. The object of this paper is to formulate such basic principles, for this is all that is required in order to direct the work of technical assistants. The busy specialist cannot be expected to acquire a detailed knowledge of remedial exercises, occupational therapy, gymnastics, recreational therapy, and the like; nor is this necessary. The experience out of which this paper is compiled was gained in directing the work of an accident service—and particularly the work of the Miners' Rehabilitation Centre at Berry Hill Hall—so it has a particular bearing on fractures and other injuries of the locomotor system. But principles are principles, and should remain true for any extension beyond this field. It is hoped, therefore, that, while being of particular interest to those engaged in the traumatic surgery of the locomotor system, the general principles here discussed will also interest that much larger body of physicians and surgeons who are now being urged by the Ministry of Health to incorporate exercise therapy into their systems of treatment. The general principles to be discussed may be stated as follows:

Therapeutic exercise must be: (1) both specific (focal) and general; (2) administered with due regard to dosage; (3) rhythmic in regard to contraction and relaxation; (4) progressive in (*a*) range, (*b*) power, and (*c*) time; (5) variable in form—the chief forms being (*a*) medical gymnastics, (*b*) occupational therapy, and (*c*) recreational therapy.

It is beyond the scope of this paper to discuss the detailed application of these principles. Where this is done it is merely in order to exemplify the principle.

Focal and General Exercises

Specific (or focal) exercises are those which pick out some particular muscle group for selective redevelopment. This in effect means devising exercises which make the desired muscle group work as a prime mover. It may be asked why this is necessary—why, for example, cannot these muscles be developed by general activity? The answer is that in a good many cases they can, but that in such cases the result depends on any general movement in which the muscle normally takes part being performed in the normal manner. In fact, however, most patients learn more quickly how to dodge the use of inefficient or painful muscles. In other words, they learn trick movements resulting in compromises. But compromises are not desirable if the normal mechanism can be regained, so focal exercises differ from general exercises in stressing, not the end to be attained, which is functional movement, but the means whereby it is attained, which is the production of the movement by a particular muscle group acting as a prime mover.

The use of focal exercises, therefore, is of most importance in injuries of the locomotor system, for in these conditions certain muscles and joints are affected a great deal while the rest are comparatively normal. Such a situation lends itself much more readily to the development of trick movements than does a *generally* weakened locomotor system following ordinary sickness; for if the *whole* system is depressed the muscles still retain their normal *relative* action even if each muscle is itself inefficient. Trick movements, on the other hand, depend on functional inequality. All faulty gaits, for example, are trick movements acquired by a patient who is made to walk when his muscles or joints are physically incapable of producing a normal gait, and it is the duty of the surgeon to pick out the particular muscles and joints concerned and redevelop them by focal exercises in order to prevent a temporary compromise from developing into a fixed habit. From these arguments it is obvious that general exercises alone, properly supervised, will usually be sufficient for the deterioration following ordinary sickness, but that in injuries affecting specific parts of the locomotor system a combination of both general and focal exercise is necessary.

An example of the need for deliberate "focusing" in exercise technique is afforded by the quadriceps. This important muscle group is wrongly regarded as a single muscle. In fact, it behaves more like two separate muscles, the vastus internus

being quite selective in its action. Extension of the knee-joint to within about 15 degrees of full movement can be brought about entirely by the rectus femoris, vastus lateralis, and vastus intermedius, under conditions of minimal stress. It is only when the stress is markedly increased, as in single-leg weight-bearing, that the vastus internus enters into this range. That is why a weak vastus internus can be "caught out" in such activities as walking up and down stairs, running, and alternate-leg skipping. On the other hand, the last 15 degrees of extension, even against minimal stresses, cannot be effected *without* the vastus internus. This latter range is so small compared with the rest, however, that a patient may appear to be extending and flexing his knee-joint most energetically and using his quadriceps most effectively, yet never really using his vastus internus at all. This explains why "quadriceps drill" in plaster casts flexed more than 15 degrees at the knee-joint results in selective wasting of the vastus internus. This excessive flexion is quite unnecessary to prevent rotation of the fragments, and all long plasters should fix the knee well within the range of the vastus internus. It also explains why quadriceps drill on a flexed Thomas splint results in the same condition. Where this is necessary, as in supracondylar and lower-third fractures of the femur, exercises should be supplemented by selective faradism and the position of the knee brought to within 15 degrees of full extension as soon as possible. If any surgeon doubts this he should have himself put up in a flexed plaster or on a flexed splint and then try to do quadriceps drill and see if he can use the vastus internus—even when it is normal. The importance of all this is that the vastus internus is the key muscle in producing the last 15 degrees of extension and stabilizing the joint in all positions. If it is inefficient a syndrome is created familiar to all orthopaedic surgeons—the joint that "gives way" under stress or sudden unexpected movement. Of the two components of the muscle, the rectus femoris group can most safely be left to take care of itself because no compensatory mechanism can be devised in its absence—but the vastus internus needs the most focal and specific treatment because it operates over such a small range that a compensatory mechanism can be evolved. Once evolved it may become a fixed habit, and general activity will confirm rather than cure it. Further wasting then occurs, leading to the paradox of progressive disuse atrophy in an active patient. So the term "quadriceps drill" should be abolished and "vastus internus drill" substituted.

It is beyond the scope of this paper to go into questions of how to evolve special exercises for the redevelopment of vastus internus or other particular muscle groups—the object is merely to underline the principle that focal exercise technique is essential in certain conditions and to give the reasoning on which this opinion is based. It is necessary at the present time to make this point for two reasons—first, because it is being represented in certain quarters that general exercises will cure everything; and, secondly, because of the revival of occupational therapy. In this form of exercise therapy focal technique has not received the attention it deserves, and is apt to be disregarded entirely or even condemned. This will be referred to later.

The need for general exercises as a part of any system is self-evident. Here the body as a whole is exercised, and the injured muscles learn to act again as fixators, synergists, and antagonists as well as prime movers. Muscles were never intended by Nature to be individualists, so exercises aimed at their selective redevelopment must always be combined with exercises aimed at co-ordinating them with the rest of the locomotor system—a process often referred to as "re-education."

The Dosage Principle

Exercise therapy has been used in the past in such small and scattered doses that it may truly be said to have been on a homoeopathic basis. Having been "discovered," however, the new danger is that it will be given in poisonous doses. It is necessary, therefore, to point out that weak muscles *can* be poisoned by overdosage with exercise. Two factors have to be considered in this connexion—first, the optimum stress under which a muscle should exercise; and, secondly, the relative duration of exercise periods and rest periods. Generally speaking, the weaker the muscle the less should be the demands made on it, both in stress and in time. At Berry Hill Hall weak muscles are never exercised against more than 25% of their "all out" efficiency, but this proportion is increased to 50% as the muscle strengthens. At the same time the exercise periods are lengthened and the rest periods shortened.

The Principle of Rhythm

All therapeutic exercises should be rhythmic. Contraction must be followed by relaxation, and the relaxation must be complete and long enough to allow normal circulatory conditions to be restored in the muscle before it begins its next contraction. A good instructor teaching his patients will be heard uttering over and over again the incantation: "Contract . . . and rest . . . contract . . . and rest." Mr. J. H. C. Colson, former superintendent at Berry Hill Hall, introduced this principle into resisted pulley-and-weight exercises by incorporating ingenious "relaxation stops" in the pulley circuits (Fig. 2). He also insisted, most rightly, on its observance in occupational therapy. For this reason carpentry—which is mostly a matter of sustained contraction—was never used to any great extent in finger cases, whereas the craft-work known as netting, which involves a regularly alternating contraction and relaxation, was used extensively. There are other reasons why carpentry, the most vaunted of all forms of occupational therapy in official quarters, is also the worst. What is the scientific basis underlying this principle? In a muscle affected by disuse or injury the circulatory and lymphatic systems are impaired. Atrophy, even in non-traumatic cases, is always associated with intramural fibrosis. In a traumatized muscle there are many additional factors producing fibrosis, and fibrosis in muscle always impairs the circulatory condition by causing obstruction to venous and lymphatic drainage. Now, muscle more than any other tissue depends on good circulatory conditions, because the products of contraction (chiefly sarcolactic acid), unless speedily carried away, act as a muscle poison, and fatigue results. So in an atrophied or fibrotic muscle it is essential to give the embarrassed circulation time to clear the breakdown products—and hence exercises should be rhythmic in character as opposed to exercises which call for sustained contractions.

The Principle of Progression

The principle of progression is one of the most important and firmly established features of the Ling system of gymnastics. But its use in remedial exercises, in which it is much more necessary, has been neglected—and the same applies even more so to occupational therapy. It is not sufficient that a muscle should be made to contract—it must contract against gradually increasing stresses, through gradually increasing ranges of movement, and over gradually increasing periods of time. It is not a matter of devising an exercise to make a muscle work; the task of the physiotherapist is to devise a whole series of exercises which provide smooth progression from the stage of extreme weakness to the stage of full use against the stresses of normal work. This progression must be in three dimensions—in range of movement, in power of movement, and in duration under stress—but by far the greatest of these is *power*. Range without power is worse than useless, for in its extreme form we have a flail-joint. Power without range, on the other hand, is compatible with full function in heavy industry. So progression in power is of absolutely vital importance in exercise therapy.

But to consider first the methods of increasing range of movement. Passive movements, at one time widely practised, are now almost universally condemned. Active movements, on the other hand, are universally recommended. But what fundamental differences are there that place them such poles apart? Surely only two factors are involved: first, that the force applied is much greater in passive movement; and, secondly, that this greater force is not under the patient's control. Now there is no reason why the force available should not be increased—in fact, this is desirable. Suppose, for example, that the patient is trying to mobilize a stiff shoulder limited in abduction, and the normal muscles available to produce this movement are wasted and weakened—as they are likely to be. Would any surgeon object if the power of those muscles were suddenly increased to normal or even a little above

normal? On the contrary, he would welcome it. So the only objection to passive movement must be that this desirable extra force is provided by an outside agency—and that is, of course, a very legitimate objection. But suppose that by means of a pulley circuit (Fig. 1) the abductors of one arm

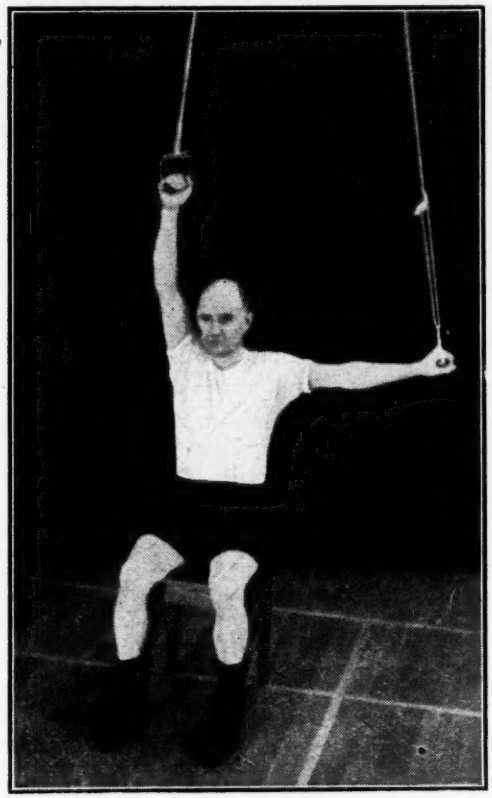

FIG. 1.—Remedial exercise with a pulley circuit for self-assisted active movement.

are reinforced by the adductors of the opposite arm—then the extra force available for breaking down adhesions and stretching contracted tissues is still under the patient's control. This type of exercise has been developed at Berry Hill Hall for practically all the important joints of the body, and has been called "auto-assisted active movement (A.A.A.)." Even the proximal interphalangeal joints of the fingers can be mobilized in this way by strapping the stiff finger above and below the joint to its fellows on either side. The following is an example of the use of the pulley circuit.

The patient shown in Fig. 1—a miner aged 50—sustained a severe shoulder injury which resulted in complete stiffness. At the beginning of treatment at Berry Hill Hall he had no shoulder movement at all, and was so weak he couldn't lift a bucket. It took three months' hard work to cure this most difficult case; but it was worth every minute of it, for he has regained full movement and full power, and is now back at his job as a coal-face miner.

Apart from its use in recovering movement, this type of exercise has another indication, and that is to preserve movement that would otherwise be lost through painful inhibition. To take the shoulder once more as an example—it is well known that many stiff painful shoulders result from simple contusion, and the difference in prognosis between a dislocation due to a fall on the hand without damage to the deltoid and one associated with contusion to the deltoid is equally well known. Contusion in certain muscles, of which the deltoid is one, produces severe pain when the muscle contracts under stress. To guard against this the patient elevates his arm by fixing the shoulder-joint and rotating the scapula, thus producing the familiar "reversed rhythm" seen in these cases. Painful inhibition of movement in a contused muscle leads to fibrosis; fibrosis leads to more pain, and so the vicious circle goes on till it ends as a "frozen shoulder." What was originally a painful inhibition becomes a painful contracture. There are two aims of treatment in the early stages of such a condition—to cure the pain and so release the inhibition, and to preserve the normal range of movement during this process, which may be prolonged. The best way to preserve movement in these cases is by the use of auto-assisted active exercises. Another method is by using a weight to assist the movement. This can be done on the same pulley apparatus, the weight being gradually diminished as improvement allows. Once the stress is removed the muscle is able to contract without pain, and normal rhythm and full range are restored. Strictly speaking, this is not an example of progression in range—it is a special use of exercise technique to prevent loss of range; but it embodies some very important general principles.

Progression in power is usually obtained in gymnastics by making the performer do the exercise from different gymnastic positions. In the simplest form of the exercise a position and a technique are adopted which allow the performer to obtain help from accessory muscles. In the various progressions these are cut out by degrees. Another gymnastic method of obtaining progression in power is by using the lever principle in reverse. For instance, in extension of the spine from the prone position, the arms are first kept at the sides, then clasped behind the neck, and finally fully stretched out ahead of the patient. A third method is to start by performing the exercise in "inner range" and gradually progress to "outer range" movement on the theory that all muscles have to act more powerfully in outer range.

But the most scientific way of obtaining progression in power is to add a resistance which can be accurately measured. This is achieved very simply and very effectively by the use of pulley-and-weight apparatus, the principle of which is illustrated in Fig. 2. This type of apparatus is used only for the focal

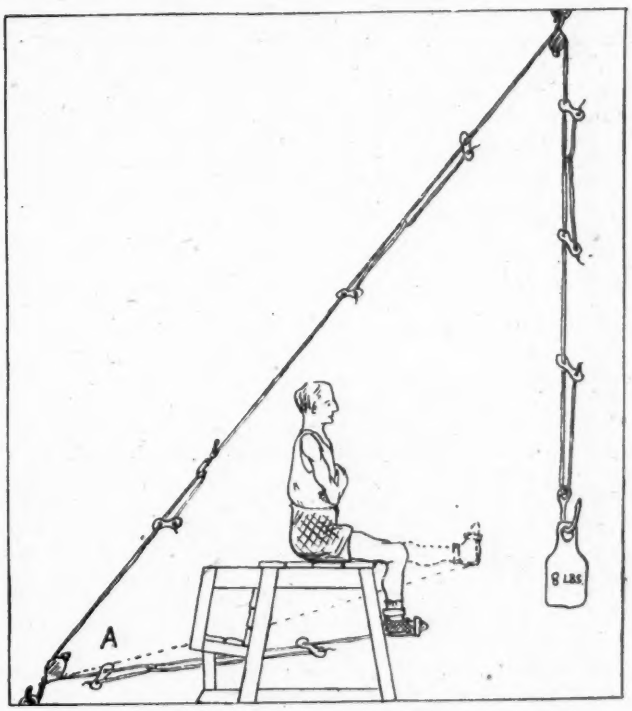

FIG. 2.—The principle of the calibrated resistance exercise (A = relaxation stop).

type of exercise, so it is essential to isolate the muscle effectively as a prime mover. The "relaxation stop," mentioned earlier, is a knot or metal runner in the cord arranged in such a way that it engages in the pulley and takes the entire strain of the weight in the resting position of the exercise.

It is extremely important in using this type of exercise to pay due regard to the dosage principle. Failure to do this has produced chronic sprains, especially in knee cases, and has led several surgeons to issue warnings against the use of resisted exercises altogether for the knee. This is quite wrong, because the principle of progression in power is unchallengeable, and the apparatus evolved to achieve it is beyond criticism. The fault lies in the use of the method without due regard to the dosage and relaxation principles. At Berry Hill Hall no ill effects have been observed when using the technique

described earlier in discussing dosage. Another way to produce sprains in knee cases is by failing to redevelop the vastus internus and then making it work against the same resistance as the rectus femoris component. This in its turn is due to failure to recognize the vastus internus as a separate muscle and therefore to use the entirely separate pulley circuit appropriate to its action.

The third type of progression in exercise therapy is progression in time—that is, carrying out the exercise under the same stress for increasing periods. This is very important in rehabilitating industrial workers, because industry demands not only that a workman shall be able to exercise his muscles against certain stresses but that he shall be able to do so continuously for whatever number of hours constitutes a "shift."

Principle of Variation in Form

If exercise therapy is to be carried out for many hours a day it must be disguised in various forms to make it palatable to the patient. Medical gymnastics alone would become boring; the patient would lose interest and initiative, and therefore cease to put his best endeavours behind them. So exercise therapy must be capable of assuming different forms, though in doing so it must conform as nearly as possible to the general principles already laid down. Unfortunately this is not always the case, and in the two chief disguises—occupational therapy and recreational therapy—the art of "sugar-coating" the pill has proved so diverting that the ingredients of the pill itself have been rather overlooked. Another reason why there must be variation in form is that medical gymnastics do not lend themselves to certain conditions. For example, no patient would sit in a gymnasium flexing and extending his fingers for six hours a day, but he will do it in an occupational-therapy department.

It is beyond the scope of this paper to discuss either occupational therapy or recreational therapy, but there are a few points in regard to both that bear on principles. Occupational therapy is used, of course, in two quite different ways—as a mental diversion (with which this paper is not concerned) and as a disguised form of remedial exercise. Employed in the latter sense, it becomes more important than ever to ensure that the proper muscles and joints are used, and that the patient is not simply learning trick movements. This can often be achieved by fixing the compensatory joints in plaster—e.g., in netting by fixing the metacarpo-phalangeal joints in order to make the patient use his proximal interphalangeal joints. Forms of craft-work should be favoured in which the movements are an alternate contraction and relaxation, such as weaving; those involving impaction stresses and sustained contraction should be avoided. Progression in range and power should not be lost sight of, and with ingenuity both can be incorporated into most forms of occupational therapy. For example, looms have been designed at Berry Hill Hall for shoulder, forearm, wrist, knee, and ankle movements, each with its own mechanism for ensuring effective muscle isolation and progression in both range and power.

The chief aim of the surgeon in all this should be not to acquire a detailed knowledge of occupational therapy but to satisfy himself that the essential principles of therapeutic exercise are being satisfied. Very little need be said about recreational therapy. It is a form of general exercise in which some sort of rough progression is possible, as, for example, in progressing from simple sitting games to walking and then running games. Games can never be very specific, nor is it desirable that they should be; their chief role is to redevelop general bodily function in a psychologically stimulating atmosphere, and the principal concern of the surgeon will be to protect his patients against the possible ill effects of their own enthusiasm or that of their fellows.

Summary

The basic principles of exercise therapy have been discussed and the following five requirements laid down:

(1) Exercises must be both focal and general. (2) They must be administered with due regard to correct dosage. This is variable from case to case and at different stages in the same case. (3) They must be rhythmic in character. (4) They must be progressive in range, power, and time. (5) They must be variable in form, the chief forms being gymnastic, occupational, and recreational.

It is considered that a knowledge of these principles is all that is required or can be expected of the surgeon or physician who has to incorporate exercise therapy into his system of treatment. The detailed application and elaboration of principles is the province of the technical assistants in the various forms of exercise therapy.

JAUNDICE FOLLOWING ADMINISTRATION OF HUMAN BLOOD PRODUCTS

BY

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At the present time human blood and its derivatives are being widely used for transfusion purposes. It therefore seems relevant to describe a small series of cases of jaundice which have followed the intravenous administration of plasma or reconstituted dried human serum.

Summary of Literature

Findlay and MacCallum (1937, 1938; with Murgatroyd, 1939) reported the occurrence of 89 cases clinically resembling infective hepatitis among 3,100 persons inoculated against yellow fever from 36 days to 7 months previously. The vaccine consisted of yellow fever virus suspended in human serum, which was obtained at first from patients who had recovered from yellow fever, but latterly from healthy donors without a past history of jaundice. The volume of serum injected in each case never exceeded 0.275 c.cm. These observers clearly demonstrated that the disease was not a form of yellow fever, and suggested that it was due to a hepatotoxic virus in the serum. Soper and Smith (1938) and Fox *et al.* (1942) recorded similar cases in South America.

A widespread outbreak has recently occurred among members of the American Forces inoculated against yellow fever (Memorandum on Yellow Fever Jaundice, 1942). 28,585 cases were reported during the first half of 1942, 62 of which were fatal. The clinical condition, which again resembled "catarrhal jaundice" except for the occurrence of joint pains and urticaria in 20% of cases, developed 40 to 120 days after inoculation. Necropsy showed acute or subacute necrosis of the liver, sometimes associated with nodular hyperplasia. Of particular interest is the complete absence of contact cases.

MacNalty (1937) reported 37 cases of acute infective jaundice, with seven deaths from acute hepatic necrosis, occurring 16 to 100 days after the administration of convalescent measles serum. All the 37 cases were from a group of 82 to 109 persons inoculated with serum of a particular batch. Propert (1938) in describing seven of these cases of infective hepatitis mentioned the occurrence of jaundice in two uninoculated children who two months previously had been in contact with some of the cases. Findlay and MacCallum quote several observers who have reported cases of hepatitis occurring in horses after inoculation against a number of equine diseases. The only common constituent of the inocula was horse serum (Theiler, 1919; Gordon, 1935; Marsh, 1937; Slagsvold, 1938).

Clinical Material

Late in May, 1942, an atypical case of jaundice occurred at an E.M.S. hospital (Case 3). A fortnight later a patient discharged from this same hospital (Case 4) was admitted to an associated hospital with a similar clinical condition. Comparison of the two cases showed that both had received intravenous serum several weeks previously. It was therefore felt that these might be examples of the type of jaundice caused by the administration of serum. An investigation of all cases known to have been transfused with serum or plasma in the past year was begun, and the following results were obtained.

During the period Aug., 1941, to June, 1942, 56 patients at the two associated hospitals are known to have had transfusions of liquid pooled plasma or reconstituted dried human serum. The majority of these were suffering either from peripheral vascular disease (Hayward, 1942) or from disorders associated with low plasma protein concentration. Most of the patients were otherwise in good general health at the time of transfusion and none was acutely ill. Their ages ranged from 15 to 78 years, though most were between 40 and 70. Of the cases which developed jaundice all but one (Case 8) were transfused at the sector hospital. The quantity of fluid transfused varied from 300 c.cm. to 6 litres, usually given in weekly amounts of 800 c.cm. Reactions consisting of pain in the back, vomiting, rigors, and pyrexia were not infrequently noted at the time of administration, but there was no obvious relation between the severity of the reaction and the occurrence of jaundice. The serum, which was obtained from the Medical Research Council, was prepared for use in the following manner:

The bottles of dried serum and of freshly distilled water were warmed to 37° C. in a water-bath. 200 c.cm. of the distilled water was then added to each bottle, which was gently shaken until all the serum had dissolved. The serum was thus reconstituted in normal strength and was administered through a Medical Research Council transfusion outfit.

Of the 56 patients, 50 have been traced, and 9 (18%) of them have since developed jaundice. Six of these cases were under our direct observation at the time of jaundice, but three (Cases 1, 2, and 8) were questioned retrospectively.

Case Reports

Case 1.—Railway signalman aged 59. Intermittent claudication and gangrene of toes due to degenerative vascular disease. Dec. 1 to Dec. 11, 1941: Three transfusions, each of 1,080 c.cm. of plasma. Dec. 23, 1941, to Jan. 9, 1942: Amputation of toes and then of leg under nitrous-oxide–oxygen–ether anaesthesia, followed by removal of dressing with trichlorethylene analgesia (inhalation of only 1 c.cm.). The wound was dressed with sulphanilamide powder. Feb. 7: Discharged to his home, where he had no known contact with any case of jaundice. Early in March, 1942 (approximately 90 to 100 days later): His wife noticed yellowness of sclera. Simultaneous onset of lassitude and anorexia; no rigors or sweating; no abdominal discomfort or vomiting. He was constipated, passing " white " stools and dark urine. No rash, no joint pains, no bruising. His condition remained unchanged for five to six weeks, when his symptoms cleared except for the jaundice, which persisted for a further month. There were no contact cases among his family or friends.

Case 2.—Labourer aged 41. Spondylolisthesis. Feb. 16, 1942: Transfused with 800 c.cm. serum. May 9 (82 days later), malaise. May 10: Developed abdominal discomfort and jaundice with dark urine and clay-coloured stools; diagnosed by his doctor as severe " catarrhal jaundice." June 5: Able to return to work, although the jaundice and abdominal discomfort persisted for a further four or five weeks.

Case 3.—Tool-maker aged 51. Intermittent claudication due to degenerative vascular disease; indolent plaster sore. Jan. 29 to March 17, 1942: Six weekly transfusions of serum, each of 800 c.cm. Plaster sore dressed with sulphanilamide powder. May 24 (68 to 115 days later): Generalized erythema and minutely papular rash on trunk and limbs. The rash, which lasted for three days, was not irritant and did not affect the head and neck. May 25: Progressive rise of evening temperature to a maximum of 103.2° F. on May 31, when the patient was noticed to be yellow. June 1: Jaundice deeper; liver palpable three fingerbreadths below the costal margin, and tender. Spleen impalpable. Urine contained bile pigments but not bile salts. Stools pale but not clay-coloured. W.B.C., 5,200 per c.mm. Blood sulphanilamide concentration too low to estimate. Serum van den Bergh reaction: Direct, positive in 2 minutes; indirect, 12 units. No abdominal symptoms. The temperature subsided during the next six days, but the jaundice disappeared more gradually. June 14: W.B.C., 8,200 per c.mm.—polymorphs 4,675, basophils 40, eosinophils 165, lymphocytes 2,910, monocytes 410. June 19: Liver impalpable; urine bile-free. Has remained well since. With the onset of jaundice there was a marked improvement in the rate of healing of his ulcer. Agglutination of *Leptospira icterohaemorrhagiae* negative. Blood Wassermann reaction negative.

Case 4.—Engineer aged 62. Intermittent claudication due to degenerative vascular disease. April 20, 1942: Transfused with 800 c.cm. serum. June 8 (49 days later): Malaise, anorexia, and abdominal discomfort lasting for three days. June 10: Noticed to be jaundiced. June 12: Admitted to hospital. Definitely jaundiced, with enlarged tender liver two fingerbreadths below costal margin. Spleen impalpable; urine contained bile pigments; and the stools were pale. Except for temperature of 100° F. on the first day he remained apyrexial. June 17: W.B.C., 13,400 per c.mm.—polymorphs 9,510, basophils 130, lymphocytes 2,550, monocytes 1,210. Van den Bergh reaction: Direct, positive in 20 seconds; indirect, 6 units. June 22: Passed three loose melaena stools. The depth of jaundice fluctuated but improved. July 19: Discharged with liver just palpable. Aug. 4: Still slightly jaundiced and liver still palpable. Sept. 21: Free from jaundice; liver impalpable.

Case 5.—Cabinet-maker aged 62. Intermittent claudication due to degenerative vascular disease. March 5 to 26, 1942: Four weekly transfusions of serum, each of 800 c.cm. June 16 (82 to 103 days later): Malaise and anorexia for one week. June 22: Epigastric discomfort and dark urine. June 29: Admitted to hospital apyrexial and definitely jaundiced, with a large tender liver two fingerbreadths below costal margin. Spleen impalpable; stools pale; urine contained bile pigments. Tourniquet test positive. July 1: W.B.C., 4,200 per c.mm. Van den Bergh reaction: Direct, positive in 10 seconds; indirect, 10.5 units. July 9: More deeply jaundiced. Liver enlarged to three fingerbreadths and very tender. Spleen just palpable. Depth of jaundice varied, but gradually lessened. Aug. 10: Liver two fingerbreadths and tender. Spleen still palpable. Takata-Ara weak positive. W.B.C., 5,000 per c.mm. Sept. 5: Discharged with slight jaundice and a liver which was just palpable.

Case 6.—Publican aged 57. Intermittent claudication due to thrombo-angiitis obliterans. Sept. 8 to Oct. 7, 1941: Four transfusions of serum, each of 800 c.cm. Feb. 12 to April 1, 1942: Four transfusions of serum, each of 800 c.cm. June 27 (87 to 135, or 245 to 274 days later): Became jaundiced. Symptom-free and apyrexial apart from a rise in temperature to 99° F. on one evening. Liver and spleen impalpable; urine contained bile pigments; stools remained normal in colour. W.B.C., 17,000 per c.mm.—polymorphs 8,670, eosinophils 170, basophils 85, lymphocytes 6,205, monocytes 1,870. The patient's jaundice gradually subsided in the next three weeks. Blood Wassermann reaction negative. Agglutination of *L. icterohaemorrhagiae* negative.

Case 7.—Male aged 59; messenger. Diabetes mellitus with gangrene of toes. March 11 to May 7, 1942: Six transfusions, five of 800 c.cm. of serum and one of 1,080 c.cm. of plasma. July 20 (74 to 131 days later): Epigastric discomfort and flatulence for a few days; jaundice with tender enlarged liver three fingerbreadths below costal margin; apyrexial; urine contained bile pigments; stools pale. Aug. 2: Van den Bergh reaction: Direct, positive in 30 seconds; indirect, 7.5 units. Aug. 12: Discharged from hospital feeling well, with only slight jaundice; urine free from bile.

Case 8.—Female aged 45; secretary. Calcinosis circumscripta. May 16, 1941: Transfused with 300 c.cm. of serum. July 22 (67 days later): Anorexia, malaise, feverishness, and dark urine; pale stools. Aug. 5: Jaundice confirmed by her own doctor; this persisted for about 6 weeks.

Case 9.—Traveller aged 31. Intermittent claudication due to thrombo-angiitis obliterans. June 2 to 18, 1942: Three transfusions of serum, each of 800 c.cm. Oct. 1: Lumbar sympathectomy performed under nitrous-oxide–oxygen–ether anaesthesia; followed by pyrexia up to 100.8° F. for 24 hours. Oct. 3 (107 to 123 days later): Nausea, which lasted for a few days, and gradually increasing jaundice; liver enlarged; spleen impalpable; urine contained bile pigments; stools, normal in colour, contained no occult blood; apyrexial. Oct. 5: Blood van den Bergh reaction: Direct, immediate positive; indirect, 12.5 units. W.B.C., 8,900 per c.mm.—polymorphs 6,230, eosinophils 180, lymphocytes 2,135, monocytes 355. The jaundice gradually subsided in the next three weeks. Blood Wassermann reaction negative. Agglutination of *L. icterohaemorrhagiae* negative.

Epidemiology

Of these cases all but one (Case 8) were transfused in the sector hospital. There were no cases of infective hepatitis among patients in the wards of this hospital during the significant period. Although three nurses developed infective hepatitis during this period of seven months, they were working elsewhere in the hospital, and at no time had contact with the cases described. There were no cases of jaundice among the medical and nursing staffs of the wards concerned. All the patients who returned to their homes before developing hepatitis denied contact with any case of jaundice. The cases were distributed throughout four wards, and significant contact between them while they were jaundiced occurred in only one instance. Case 6 was in Ward MG1, and not confined to bed during the whole period in which Case 3 was jaundiced. He himself developed jaundice five weeks after the onset of prodromal symptoms in Case 3. There were 32 other patients in the ward at this time; of these only one (Case 9) has developed jaundice, and he only after an interval of three and a half months.

No other cases of jaundice have come to our notice among persons in contact with our patients.

Clinical Picture

The clinical features of these cases are summarized in the accompanying table. The onset of symptoms, which was sudden, occurred 49 to 107 days after the last transfusion. Jaundice, which appeared at the onset of the illness in five cases, was intense in some patients, and often varied in degree from day to day. Malaise, nausea, and epigastric discomfort, which sometimes persisted for some weeks, accompanied the jaundice in seven cases and preceded its onset by a few days in three. In only one case (Case 3) was a rash observed: it preceded the onset of jaundice by eight days. None of our patients complained of joint pains or biliary colic. In all but one of the cases we examined the liver was enlarged and tender; but in only one (Case 5) was the spleen palpable. In no case was ascites demonstrated. There was a positive direct van den Bergh reaction in five cases and unduly pale stools in seven. The severity of the illness, which bore no relation to the volume of fluid transfused, varied from the symptomless jaundice of Case 6 to the severe illness with intestinal haemorrhage of Case 4. On the whole the cases were of moderate severity, and only Case 4 gave rise to anxiety. The duration of the illness varied from 3 to 12 weeks.

Summary of Cases

Case	Age and Sex	Amount of Serum or Plasma (c.cm.)	Symptomless Period in Days	Symptoms and Signs									Pathological Investigations					
				Onset of Jaundice (Day of Disease)	Malaise, Nausea, and Abdominal Discomfort	Rash	Pyrexia	Liver Enlargement in F.B.s	Spleen	Stools	Melaena	Duration in Weeks	Total W.B.C. per c.mm.	Direct van den Bergh	Indirect (units)	W.R.	Takata-Ara	Leptospira Agglutination
1	59, M.	3,240 plasma	90–100 approx.	1st	Present several weeks	—				"White"		10						
2	41, M.	800 serum	82	2nd	Present several weeks	—				Clay-coloured		8–9						
3	51, M.	4,800 serum	68–115	8th	—	+	Up to 103° F. 1st fortnight	3 F.B.s. Tender	—	Pale		4	5,200	+	12	—		—
4	62, M.	800 serum	49	3rd	Present three days	—	100° F. on 1st day	2 F.B.s. Tender	—	Clay-coloured at times	+	7½	13,400	+	6			
5	62, M.	3,200 serum	82–103	7th	Present one week	—	—	3 F.B.s. Tender	+	Pale		12	4,200	+	10·5		Weak +	
6	57, M.	3,200 + 3,200 serum	87–135 or 245–274	1st	—	—	99° F. on 1st day —	—	—	Normal		3	17,000			—		—
7	59, M.	4,000 serum + 1,080 plasma	74–131	1st	Present a few days	—		3 F.B.s. Tender	—	Pale		3½		+	7·5			
8	45, F.	300 serum	67	1st	Present one week	—				Pale		6						
9	31, M.	2,400 serum	107–123	1st	Present a few days	—	Post-oper. only	3 F.B.s	—	Normal		3	8,900	+	12·5	—		—

Diagnosis

The clinical picture, though showing considerable variation, most closely resembles that of infective hepatitis as described by Cullinan (1939); it does, however, differ in the following respects:

(1) Our patients belong to a considerably older age group than that usually affected (Newman, 1940; Norton, 1939), although Pickles (1939) states that infective hepatitis is not uncommon among older people. Fox *et al.*, in describing an outbreak of jaundice following yellow fever inoculation, report a significantly higher incidence among the older age groups. (2) The illness was, on the average, of greater severity and more protracted. (3) In only one (Case 6) was there a history of contact with a possible source of infection. (4) No cases of jaundice have been reported among persons in contact with our patients.

We were not led to expect a subacute necrosis due to any of the better-known hepatotoxic chemicals. The absence of relapses in our patients is also against this diagnosis.

The clinical picture of our cases does not resemble spirochaetosis icterohaemorrhagica: there was no albuminuria or marked polymorphonuclear leucocytosis, and the serum from three cases gave negative agglutination reactions.

Discussion

From the clinical and epidemiological evidence it seems unlikely that this is a straightforward outbreak of infective hepatitis. These were the only cases of hepatitis in the hospital at the time, and the only common causal factor was the administration of serum or plasma. It therefore seems probable that these fluids are of aetiological significance and that this outbreak is similar to those occurring after yellow fever and measles inoculation. Our cases differ, however, in that they were given relatively large quantities (300 to 6,400 c.cm.) intravenously, compared with very small amounts (0.275 c.cm.) intramuscularly. Most of our patients, too, were known to be suffering from arteriosclerosis, and might conceivably have had some liver change, rendering them more susceptible to hepatotoxic agents. In two of the cases, however, there was no evidence of vascular disease.

There are three main possibilities as to the part played by the serum in the production of jaundice:

1. Hypersensitivity Reaction.—There was no direct evidence in favour of this view: our patients did not give a history of allergy and showed no eosinophilia. The time relationship would appear to be too long for an anaphylactic type of reaction.

2. Introduction of a Hepatotoxic Agent.—In some of the recorded outbreaks there has been evidence that only certain batches of serum have been hepatotoxic. In our series comparatively few of the batch numbers are available, and in only two cases (4 and 9) do we know all the numbers concerned. In these two cases there was one common batch (120 KY), which was also administered to Case 7. Serum from this batch was given to at least two other patients, who did not develop jaundice. Batch 120 KY was derived from a pool of 50 litres of serum, a contribution of 250 donors, whom it was not possible to trace. It is probable that Case 8 did not have serum from this batch, and Case 1 was transfused only with plasma. There is therefore no evidence of an abnormality confined to one batch of serum. If a hepatotoxic agent has been introduced it must be one which is common to both dried serum and liquid pooled plasma. It might be either a virus contained in the fluid, as suggested by Findlay and MacCallum, or some toxic chemical substance such as altered plasma protein. In our series there is no evidence to favour one or other of these hypotheses.

3. Increased Liver Susceptibility.—Certain agents, such as neoarsphenamine (Stokes, Reudemann, and Lemon, 1920) and acriflavine (Murray, 1930), are believed to reduce the resistance of the liver, rendering it more susceptible to the virus of infective hepatitis. It is possible that our cases represent an outbreak of this disease, with the serum acting as a toxic agent, but this seems unlikely in view of the lack of infectivity and the long symptomless period.

Summary

Nine cases of jaundice are described which developed 7 to 16 weeks after transfusion with serum and plasma, and closely resembled the hepatitis following inoculation against yellow fever and measles.

The association of such cases of jaundice with transfusion may easily be overlooked in view of the long symptomless period which intervenes.

We wish to thank various members of the staff of St. Bartholomew's Hospital for permission to publish the cases under their care, and gratefully acknowledge the helpful criticism of Dr. A. E. Gow, Prof. Ronald V. Christie, and Dr. Hugh Barber.

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A NEW AND SIMPLE METHOD FOR SUBCUTANEOUS LIGATURE OF VARICOSE VEINS

BY

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Major, R.A.M.C.

The injection of various solutions into varicose veins often causes their obliteration; but this technique is generally useless when the upper part of the great saphenous vein is varicose: the downward pressure of this long column of blood unfortunately unseals the attempt at thrombosis.

In the past decade surgical opinion has recognized this factor, and operations for high ligature of the vein have become standardized. These are usually, and rightly, combined with injection of the vein's lower reaches. This combined operation is generally very successful. Lately, several surgeons have practised a still simpler technique: the vein is compressed subcutaneously instead of by open operation. I use the word "compressed" advisedly, as will appear later from the text, although these others refer to their methods as ligature. By this technique a curved needle is thrust into the skin at the side of the vein; it passes deep to the vessel and reappears at the other side of it. The two free ends are then tied over a pad of gauze. Below this the varicosities of the lower leg are injected.

I find that there are several marked advantages in these subcutaneous methods, particularly from a military point of view. First, there are a large number of men who obstinately refuse to be "cut about." When it is explained to them that the cure (I carefully avoid the word "operation") entails absolutely no cutting, they then find that they can furnish no adequate reason against being cured. Also, the method, being ambulatory, effects a great saving in hospital beds. With an open operation, even after the patient leaves the ward, he must remain relatively immobile until the wound has healed strongly. The use of the subcutaneous operation should result in raising thousands of soldiers into a higher category.

The method hitherto used is described as subcutaneous ligature. It is certainly subcutaneous, but it is a unilateral compression, not a ligature. A true ligature should evenly compress the vein's entire circumference towards its centre. A much more effective and permanent result is likely to follow from a true ligature. The simple method described below forms a true ligature around the vein. In addition the little operation is complete at one sitting. Patients need not return to the clinic for removal of stitches. Usually I tell them to return, but it is more for my interest than in theirs.

Method

The patient stands and the highest visible part of the internal saphenous vein in the thigh is shown; but it is advisable to keep at least 2 in. below the saphenous opening. A local anaesthetic wheal is raised on each side of the vein. A curved cutting needle is then threaded with catgut. It is plunged into one wheal, passes deep to the vein, and emerges through the skin via the opposite wheal (Fig. 1). This curved needle (Fig. 2) is now removed from the catgut and a straight needle

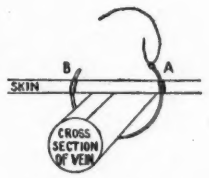

FIG. 1

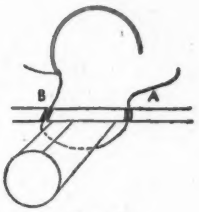

FIG. 2

FIG. 1.—Stage I: Curved needle passes through skin, then deep to vein, to emerge through skin at opposite side. Thus the two skin punctures A and B are made.

FIG. 2.—Stage II: Curved needle has emerged. A straight needle must now be substituted on to the catgut.

substituted on to the catgut. This straight needle is now thrust back into the skin *via the same minute opening* through which the curved needle has recently emerged. The straight needle passes in front of the vein and emerges through the same minute hole where the curved needle made its original entry (Fig. 3).

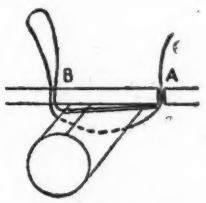

FIG. 3

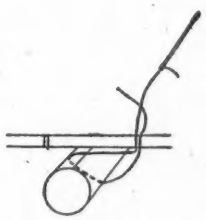

FIG. 4

FIG. 3.—Stage III: Straight needle has re-entered skin via B and is about to emerge via A. Here needle passes in front of vein.

FIG. 4.—Stage IV: Straight needle has emerged and the two original ends of the catgut are ready to be tied together with a reef-knot, forming a true ligature around the vein.

The two ends of the catgut are once more in juxtaposition (Fig. 4); they are tied fairly tightly and cut short; the knot retracts and almost disappears. The little operation is complete. It is extremely simple to do; in fact, reading about it demands more effort than actually doing it. The area receives no dressing other than a small piece of bare elastoplast. This is removed in one week, when the catgut knot will have disappeared spontaneously. There will now be a minute puncture and the surrounding skin will have a slightly traumatized appearance, but no further treatment is necessary; in a short time the skin regains its normal appearance and elasticity.

A few days after the original ligation the varicose veins below the knee should receive one or more injections as necessary, but great caution should be observed; only a small quantity of the thrombogenetic fluid should be injected at first (1 c.cm. of 5% sodium morrhuate would be a good initial or test dose). The reason for this cautious and small injection is obvious: with the main internal saphenous vein ligatured the venous current is so slow that dilution or washing away of the chemical hardly occurs; from a minimal dose maximal results are obtained.

For a week after the ligation patients can move about and are quite fit for light duties. After that they rapidly become normal.

Discussion

For the past few months I have carried out this simple procedure on every suitable case that has come under my care, the results being invariably successful. I must admit that as yet I have had no large series of cases. The procedure is so simple that I have already begun to ligate the larger varicosities of the lower leg in preference to their injection, though care is exercised in avoiding flexures.

Many surgeons have objected to any ligation of the saphenous vein short of its junction with the femoral vein. Some have even stressed the necessity for ligating the small tributaries (superficial epigastric, etc.) that flow into the vein at this level. In spite of these theoretical objections there is no doubt that ligation at a low level is effective. Is it permanent? Possibly not, but this slight procedure is so rapid and easy for both surgeon and patient that it is certainly worth doing, even though no lifetime guarantee is attached. In any case, we are living in times when it is probably wise to follow a short-term policy in such matters. If we can bring a man, and more especially a soldier, into a higher category for the duration of the war it is worth while.

Summary

A new and simple method is described for the complete subcutaneous ligature of varicose internal saphenous veins. It has the advantage that the operative treatment is complete at one sitting and that no incision is necessary. The treatment is ambulatory.

POST-OPERATIVE RESPIRATORY COMPLICATIONS IN SERVICE CASES

BY

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Being struck by the high incidence of post-operative respiratory complications in Service cases as compared with those occurring in civilians, and noting that Kaye (1941) and Binning (1940) have described similar experiences, we decided to keep a record of a series of consecutive cases in an attempt to find some causative factor.

A record was kept of the age, operation, premedication, type and amount of anaesthetic, duration of anaesthesia, any unusual incident during anaesthesia, and any post-operative complications in a series of consecutive cases undergoing surgical procedures at an E.M.S. hospital. The patients were all members of H.M. Forces, the great majority of them anaesthetic-resistant subjects in the "pink" of physical condition. Many of them had that type of "dust and tobacco pharyngitis" described by Kaye (1941). The wards were remote from the operating theatre, necessitating a journey in the open air to and from the theatre.

Clinical

The cases developing post-operative respiratory complications all followed a very similar course. The temperature rose on the second, third, or fourth day to a point between 100° and 102° F., with cough and purulent sputum. All had moist sounds in the chest, which were usually most noticeable at the base on the side operated on. The signs were those of a simple bronchitis, and only three had signs of consolidation. If the temperature rose above 101° F. sulphapyridine was given; but the course did not seem to be materially altered by this, for in four days from the onset of symptoms most of them had settled down to normal, the sputum had become very scanty, and what there was of it was colourless and frothy.

All patients were operated on at the earliest opportunity, the majority on the day after admission, so that the risk of their getting any infection in the ward was reduced to a minimum. Most of them were smoking heavily up to the time of operation, and at one time, from February to April, all patients operated on for hernias and appendicitis were forbidden to smoke till after the fourth day. It was not found that stopping smoking after operation had any effect upon the incidence of complications, and non-smokers were affected as well as smokers.

It was soon apparent clinically that the power to cough and to breathe deeply were factors, and we began to institute measures to encourage free movements and deep breathing. For the 24 hours after operation all men operated on for abdominal conditions were given inhalations of carbogen for ten minutes every two hours when awake. This did not make any difference that we could detect. We then began to get all these cases out of bed the day after operation; from the second day they stayed up longer, and were encouraged to walk if they wanted to. This procedure was continued even when the temperature rose, as the men soon found that they were able to cough much more easily when sitting in a chair than when propped up in bed. This routine was adopted after a personal communication from Lawrence Abel. On the first day the patients move out of bed rather unwillingly, on the second day they are quite willing to sit by the fire, and on the third or fourth they begin to walk about the ward and to go to the lavatory of their own free will. This has not lessened the incidence of complications, but it has diminished the time taken for recovery and has possibly been a factor in the avoidance of a real pneumonia. Before we started getting these cases up three men developed consolidation, but since that time we have had only one case, to be described later. When treated in this way the cough made no difference to the man's rate of recovery, for after four days he seemed none the worse, and was transferred to a convalescent home on the eighth day.

[The final end-results of the operations for hernia, which at present seem most satisfactory, will, it is hoped, be the subject of a later communication.—D. J. M.]

Throughout this series a critical attitude has been adopted as to what constitutes a chest complication. Any cough, even without rise of temperature or without sputum, has been recorded. As it was found that some house-surgeons were more critical in their attitude than others, the latter part of the investigation was entrusted to one person who made regular ward rounds, with the post-operative condition of patients as the sole object.

Deaths.—In this series there has been no death solely attributable to anaesthesia, but one case in which the patient died should be noted. He was admitted with a paralytic ileus, and an ileostomy was performed under nitrous-oxide–oxygen–ether anaesthesia. He had a continuous intravenous glucose-saline for eight days. No pulmonary symptoms developed. Twenty days later the ileostomy was resected under nitrous-oxide–oxygen–trilene–ether anaesthesia and the abdomen closed. After the second operation he was gravely ill, and among other symptoms developed a pneumonia which did not resolve, and he died 84 days later. Necropsy showed a number of small lung abscesses and a local peritonitis.

Complications after Various Operations

Out of 2,000 consecutive cases undergoing surgical procedures under anaesthesia, 101 had post-operative temperatures of over 100° F. with cough and sputum, and 46 developed post-operative cough with no rise in temperature. It soon became obvious that the type of operation and not the anaesthetic employed was the essential factor, and the following table shows the incidence of these complications after various types of operation.

TABLE I

Operation	No.	Fever and Cough	Cough	Total	%
Amputation digit	31	0	0	0	0
Amputation limb	10	0	0	0	0
Appendicetcomy	98	26	9	35	36
Circumcision	41	0	0	0	0
Cystoscopy	38	0	0	0	0
Débridement	149	1	2	3	2
Haemorrhoidectomy, etc.	58	0	0	0	0
Hernial repair	192	61	26	87	45
Laparotomy	17	4	2	6	35
Meniscectomy	57	0	2	2	4
Miscellaneous	194	3	1	4	2
Nephrectomy, etc.	3	1	0	1	33
Orchidectomy, etc.	51	2	2	4	8
Orthopaedic operations	114	0	0	0	0
Perforated peptic ulcer	6	2	1	3	50
Plaster	123	0	0	0	0
Tonsillectomy	113	1	0	1	1
Trendelenburg operation	128	0	1	1	1
Minor operations of less than 10 minutes' duration	577	0	0	0	0
Total	2,000	101	46	147	7·3

It is interesting to compare the figures for hernia repairs (average duration of anaesthesia, 27.34 minutes) with those for Trendelenburg operations (average duration of anaesthesia, 27.55 minutes). The types and amounts of anaesthetic employed were entirely comparable.

It may be argued that the extra depth of anaesthesia required to obtain the necessary relaxation for abdominal operations is a factor in the causation of respiratory complications. Against this the figures for haemorrhoidectomies should be noted. Twenty-three of the cases quoted were performed under lower-second-plane inhalation anaesthesia; the remainder were done under low spinals.

Intubation.—Out of 192 cases in which endotracheal tubes were passed 12 (6%) developed complications; 9 of them were abdominal operations. This percentage corresponds very closely with that obtained by Campbell and Gordon (1942) in a series of Canadian soldiers.

Complications after Hernia Operations

Incidence with Various Anaesthetics.—As hernia repairs are the largest group with a high "chest" incidence an analysis has been made below of the types of anaesthetic used.

TABLE II.—*Service Cases*

Anaesthetic	No.	Fever and Cough	Cough	Total	%
Pent.–N_2O–O–ether (plus) ..	29	13	4	17	59
Pent.–N_2O–O–ether (minus)	20	3	2	5	25
Pent.–N_2O–O–vinesthene ..	15	3	1	4	27
Pent.–N_2O–O–trilene ..	44	11	7	18	41
Pent.–N_2O–O	10	3	1	4	40
Continuous pentothal ..	2	1	1	2	100
Cyclopropane	8	3	2	5	62
Spinal	4	2	1	3	75
N_2O–O–ether (plus)	15	8	1	9	60
N_2O–O–vinesthene	7	2	1	3	43
N_2O–O–ethyl chloride ..	1	0	1	1	100
N_2O–O–trilene	13	4	2	6	46
N_2O–O–trilene–ether (plus)	3	1	1	2	67
Closed circuit ether	7	3	0	3	43
Oxford vaporizer–ether ..	10	2	1	3	30
Oxford vaporizer–trilene ..	4	2	0	2	50
Total	192	61	26	87	45

Ether (plus): More than one ounce of ether per half-hour of anaesthesia.
Ether (minus): Less than one ounce of ether per half-hour of anaesthesia.

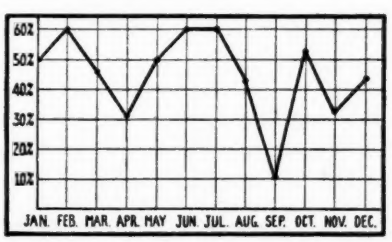
These figures are admittedly much too small to show the real complication incidence of any of the types of anaesthetic, but they do tend to show that there is little real difference between them.

The incidence among hernia repairs on civilians during the same period was as follows.

TABLE III.—*Civilian Cases*

	No.	Fever and Cough	Cough	Total	%
Men	36	5	3	8	22
Women ..	18	2	1	3	17
Children ..	8	0	0	0	0
Total ..	62	7	4	11	18

Season.—The seasonal incidence of complications following hernia operations showed a peak of 60% in February, falling to 31% in April, rising to a fresh peak in June of 60% and then falling to 11% in September.



Graph showing seasonal incidence of complications after hernia operations.

Bacteriology.—No predominating organism was found in a small series that had their sputa examined. When more than one case from the same operating list developed coughs their sputa showed no evidence of a common infection.

Age.—An analysis of the various age groups showed nothing of interest: 18 to 25, incidence 39%; 25 to 30, incidence 54%; 30 to 35, incidence 46%; 35 to 40, incidence 55%.

Radiological

A small series of cases, mostly hernia repairs, were examined with *x* rays on the day after operation to observe movements of the diaphragm. They were examined lying, with the tube overhead centred over the diaphragm and the screen held below the bed. The movements could usually be seen clearly, but in some cases it was difficult to make out the movements on the left side owing to the heart shadow. It was found that there was a considerable variation in different patients. In some, very little movement of any sort could be detected with normal breathing; in others the movements were quite normal, and comparable to non-operated controls. In a small series of orthopaedic cases the movements were normal. In the majority of cases the movements were symmetrical, but in a few instances one side showed a slightly diminished excursion compared with the other, and this was not necessarily on the operated side. In two cases the right dome and in one the left dome of the diaphragm was raised but showed movements.

In re-examined cases in which there was diminished movement it was found in all instances to have returned to normal on the fourth day after operation. Table IV shows the results.

TABLE IV

Operation	Movements of Diaphragm		Chest Complications
	Right	Left	
Left ing. hernia	–	– –	None
Left ing. hernia	×	×	None
Right ing. hernia	–	–	Cough, no fever
Bilat. ing. hernia	×	×	Cough and fever
Left ing. hernia	×	×	Cough, no fever
Right ing. hernia	–	×	,, ,,
Appendicectomy	– –	–	Cough and fever
Right ing. hernia	××	××	None
Left ing. hernia	×	×	,,
Right ing. hernia	××	××	,,
Right ing. hernia	×	×	,,
Left. ing. hernia	××	×	,,
Right ing. hernia	–	–	Cough, no fever
Left ing. hernia	×	–	,, ,,
Right ing. hernia	–	–	,, ,,
Left ing. hernia	– –	– –	Cough and fever
Bilat. ing. hernia	××	××	None

Movements are classified arbitrarily as:
×× Full normal movement; 3/4 in. to 1 in. excursion with deep breathing.
× Decreased movement fair excursion, about 1/2 in. with deep breathing.
– Little movement; some increase with deep breathing.
– – Hardly perceptible movement; not much increased with deep breathing.

The series is admittedly too small, but of the nine cases which developed coughs seven showed definitely diminished movements of the diaphragm, while no coughs developed in four cases which were noted as having full normal excursion. Support is given to the view that diminished ventilation of the lungs is a factor of some importance in the development of chest complications.

Summary and Conclusions

The site of operation is the most important factor. Any operation involving the abdominal wall is more likely to be followed by a cough than one in any other part of the body.

The type of anaesthetic used has little bearing on the incidence of these complications.

Intubation, *per se*, is not a factor.

The incidence is higher in Service cases than in civilians.

There is an increased seasonal incidence in February, June, and July.

Diminished ventilation of the lung is a factor of importance. This is probably the result of pain on breathing. When the pain is past and the patient is able to ventilate his lung freely the complications subside rapidly.

The more serious chest complications can be minimized by starting active movements as early as possible.

We wish to express our thanks to the Regional Hospital Officer for permission to publish this report.

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A certificate of disablement under the Workmen's Compensation Act may now be given by the Examining Surgeon for the district in which the workman lives or to which he has been removed for treatment. Hitherto this certificate could only be obtained from the Examining Surgeon for the district in which the man worked.

CAUSTIC SODA BURNS: THEIR PREVENTION AND TREATMENT

BY

H. TERRY, M.B., Ch.B.

I.C.I. (Alkali) Ltd.

Caustic soda, widely employed before the war in various manufacturing processes, is finding increased use in many wartime industries. There is a demand for information on the best way to prevent or deal with the injuries that may result to the workers, and this article is an attempt to satisfy that demand. It is based on thirteen years' experience in a works where many tons of caustic soda are manufactured every day. It is also hoped that criticisms and fresh ideas may be forthcoming for the improvement of the methods here described.

These methods have been evolved gradually. Before they were adopted a large number of men were always away from work with caustic soda burns of the skin, which took many weeks or months to heal. These burns had the appearance of black leather inlays in the skin. There are lifelike wax models of such burns in the Home Office Museum, Horseferry Road, Westminster.

Previously, caustic soda burns were treated by the application of bicarbonate of soda—with the intention that it should react with the caustic soda to form carbonate of soda—followed by washing with plain water. The results of this old-established treatment were unsatisfactory. For several days the burns appeared to become deeper each day. The sloughs were allowed to separate spontaneously, and the resulting exposed area of granulations showed no sign of healing for a considerable period and afterwards healed very slowly. On one occasion, to obtain rapid healing, a narrow burn on the forearm was excised with a margin of healthy skin on each side and the wound was sutured. Microscopical sections of the excised burn were prepared. The burn appeared to be a structureless coagulum, the adjacent tissue being crowded with leucocytes. The phenomena observed in inadequately treated caustic soda burns suggested that the coagulum of necrosed tissue held some uncombined caustic soda, which diffused into the deeper tissues for a few days, increasing the depth of the destroyed tissue and perhaps impairing the vitality of adjacent tissue that was not actually necrosed.

Caustic soda burns of the eye formerly were washed out with boric acid solution for two to five minutes at the time they happened. A prolonged period of inflammatory reaction followed, with the formation of granulation tissue over the sclerotic and the inner surfaces of the eyelids. This resulted in symblepharon. Some of the old hands have tough bands of adhesion between the eyelids and the eyeball, limiting the movements of the eye and causing considerable inconvenience. Burns of the cornea were still more serious.

Prevention

The engineer conducting a process involving the use of caustic soda should make it, when possible, a closed process, so that workers cannot come in contact with the substance. If this is impossible, pools of liquid caustic soda on the ground or leaking pipes, tanks, etc., should not be allowed. If, in spite of all precautions by the works management, the worker comes in contact with the caustic soda, the part of the body affected should at once be drenched with a current of neutralizing solution, not by immersion or compresses.

At first sight a weak solution of an acid such as citric acid, acetic acid, or hydrochloric acid appears to be a satisfactory neutralizing medium; but weak acids, if used as irrigants, might react with the tissues as well as with the caustic soda. Ammonium chloride, on the other hand, is a neutral salt that will not react with the tissues but only with the caustic soda with which it makes contact, instantly neutralizing it, with the formation of sodium chloride and the release of ammonia, which is washed away by the bulk of the unchanged irrigating solution. Our adoption of this treatment during the last 12 years has almost brought about the disappearance of caustic soda burns of the skin.

Caustic Soda Burns of the Skin

Throughout the caustic soda plant are placed large vessels (aspirators), each containing 5 gallons of 5% solution of ammonium chloride, in cupboards with open fronts, painted red to attract attention. These vessels are placed also at other points in the works where caustic soda is used. The necks of the vessels by which the solution is introduced are closed by a large rubber stopper. The rubber stopper is penetrated by a thistle-tube, to admit air for the easy withdrawal of the solution. The bulb of the thistle-tube is lightly packed with cotton-wool to prevent caustic soda dust from falling into the solution and destroying its usefulness. There is a rubber bung at the base of the aspirator, penetrated by a large glass tube to which a rubber tube about 6 feet long is attached. A spring clip controls the rubber tube and serves to hang up the latter on a hook when not in use. The clip can be instantly slipped off the tube when necessary, thus releasing a free flow of the solution. If a man gets caustic soda, solid or liquid, on his skin or clothing he runs to the nearest aspirator, unhooks the tube, presses the clip, and releases a deluge of the solution on the part affected. This stops the action of the caustic soda instantly, and in the great majority of cases prevents a burn. The number of caustic soda burns has been very greatly reduced by this method. It has gained the confidence of the men, who appreciate what it does for them. As an indication of this, as much as 12 to 20 gallons may be used on the plant in 24 hours without any caustic burn taking place. It is an advantage that the ammonium chloride solution is perfectly harmless to the tissues and will not injure the eyes (it has a very corrosive action on most metals).

If there has been such delay in the application of the ammonium chloride that destruction of the epidermis has taken place, and there is in fact a burn, the part should be drenched with a current of ammonium chloride solution for 10 to 15 minutes and then with plain water or normal saline for one hour continuously. This treatment will minimize the severity of a burn and prevent it becoming as deep as it otherwise would. It is then treated as a heat burn. Everyone has his own ideas about the treatment of burns; but we have treated them by washing the area with soap and water, removing dead tissue by a gauze swab soaked in alcohol, and then washing with ether. A fourfold pad of plain white sterilized lint soaked in a 2% solution of tannic acid is then applied and secured by a bandage. This pad is left in place, without attempting to separate it, until it is able to fall away by its own weight when the bandage is removed. This takes place in three weeks, more or less.

In the uncommon cases in which a burn has occurred through delay in irrigating with ammonium chloride solution, this has happened because access to the ammonium chloride solution has not been obtained soon enough (30 to 40 seconds), and occasionally a man has been unaware of contact with caustic soda until burning has taken place. In rare cases a man of dull wits has not troubled to go to the solution and has had to be treated for a deep burn of the old type. Deep caustic soda burns of the skin when they occur have lately been treated by obtaining a firm crust by the application of the tannic acid compress and, after this has formed, applying blue paint to the burn and dressing it with gauze soaked in blue paint. Blue paint was introduced by Bonney, and consists of 1 part brilliant green, 1 part crystal violet, 99 parts rectified spirit, and 99 parts water. This lessens the risk of infection in a deep burn.

Caustic Soda Burns of the Eye

The wearing of properly designed and well-fitting goggles should be compulsory, and this will usually prevent caustic soda from reaching the eye; but it seems impossible to ensure that goggles shall be properly worn on every occasion when there is danger. For the treatment of these cases, eyewash-bottles should be available every few yards in any plant where there is possibility that caustic soda in solid or liquid form may reach the eye, and should be placed in little cupboards fixed at a convenient height, with open fronts and painted red to be conspicuous. The bottles, which contain 5% ammonium chloride solution, should be 8-oz. wide-necked ones, the neck closed with a rubber stopper with two holes—one for the air-inlet tube, which is carried to the bottom of the bottle

and need only project from the stopper half an inch, and the other for the irrigation tube, which is bent at an obtuse angle outside and penetrates only for about a quarter of an inch beyond the stopper inside the bottle. The eyewash-bottle is used by turning it upside down and flushing the eye by gravity flow. Any attempt to modify the bottle so that it may be used like a wash-bottle in a chemical laboratory, by mouth-blowing, must be forbidden. It may be injurious.

If a man gets caustic soda in the eye, first aid must be given without delay: for this reason every man should be provided with a whistle to summon aid if necessary. Delay may lose an eye. The first-aider must take a wash-bottle from the nearest cupboard and, parting the eyelids with the finger, flush the eye with the contents of the bottle. The patient should then be taken at once to the plant surgery, which should be close to the caustic-soda plant and preferably with a laboratory adjacent, as this will ensure that a man trained in ambulance work is always available. About four specially trained men must be available on every shift, to give treatment in the plant surgery. Two of them must have instructions to leave their job and attend to the injured man immediately. He should be placed flat on his back on a couch, the foot of which is raised slightly. The eye must be irrigated continuously for one hour by the clock, with which the plant surgery must be provided. Irrigation must be performed for the first five minutes with 5% ammonium chloride solution, and for the rest of the hour with boric-saline solution, prepared as described below. During the irrigation care must be taken to pull the lower eyelid down gently so that the irrigation may reach the inferior fornix; and the injured man should be told to roll his eye from side to side so that the conjunctiva of the inner and outer corners of the eye may be reached. The upper eyelid should be gently elevated by the fingers of the first-aider, and the patient told to turn the eyeball downwards periodically so that the conjunctiva of the upper fornix may be reached.

This irrigation of one hour's duration is of supreme importance, and must be started at once. To send a case to hospital without such preliminary irrigation confronts the hospital with damage which is irreparable and which could have been prevented at the time of the accident by the measure described. In practice this treatment has reduced the time of recovery of caustic soda burns of the eye from weeks to days.

If the case is to be attended to by the works doctor he will see the patient every day and will instruct the ambulance-room attendant to irrigate the eye with warm boric-saline for 5 or 10 minutes three or four times a day, afterwards passing a blunt-pointed glass rod loaded with soft boric ointment first of all between the upper eyelid and the eyeball and then between the lower lid and the eyeball. If this is done no case of symblepharon will ever occur. The doctor will use atropine drops, argyrol solution (20%), or hot fomentations where he considers these measures are indicated. We find it advisable to adopt the first two measures in all but the mildest cases. It will be necessary for one man to be responsible for the ammonium chloride irrigators and eyewash-bottles. He must inspect them every day and fill all those that have been used. The works doctor will occasionally examine these vessels to ascertain that this is being done. Pools of caustic soda liquid on the ground and leaking joints will of course not be tolerated by the engineer-in-charge. If they are, the works doctor should have something to say about it.

With us, the tannic acid solution is made up in winchesters of 2.5-litre capacity; the date is written on the label, and any that has not been used is replaced by fresh solution at the end of three months. It is a great advantage, too, that it should be ready for instant use: tablets dissolve slowly. The cost of renewal is negligible. The quantities used are:

Tannic acid	50.0 grammes
Mercuric chloride	1.25 ,,
Water	2.5 litres

The boric solution is kept in winchesters at double strength in order that it may be diluted with an equal quantity of warm water when it is to be used. One ounce of common salt and half an ounce of boric acid are dissolved in a winchester of distilled water. We have found it convenient to have this solution ready made up in winchesters for immediate use. Saline by itself grows a mould. The addition of the boric acid prevents this happening.

Summary

Cases of contact of caustic soda with the skin are dealt with by immediate irrigation with 5% solution of ammonium chloride; by which means a burn is prevented if the irrigation is done within 30 to 40 seconds of contact.

If delay has resulted in a burn, its severity is very greatly lessened by irrigation with ammonium chloride solution.

Irrigation of the eye with 5% ammonium chloride solution, followed by irrigation with warm boric-saline lotion for one hour, reduces the severity of the eye injury to a very marked degree, so that recovery takes place in one-fifth to one-seventh the time taken with older methods.

Treatment by ammonium chloride solution must always be carried out by irrigation, never by immersion in a static solution or by compresses.

Medical Memoranda

Notes on Treatment of Respirator Dermatitis

Since the publication of Petro's article on respirator dermatitis (*British Medical Journal*, 1942, **1**, 631) 25 cases have been admitted to a certain military hospital. The first 13 cases were treated on lines similar to those laid down in that article—viz., using calamine lotion and liniment, Burow's solution, and various creams such as 1% ichthyol in zinc cream. In no case could the progress be described as satisfactory, and in order to reduce the number of days of hospital treatment other methods were adopted.

The most successful method was what I shall call the saline soak technique. In this series 12 cases were treated; every case was a severe affection, associated with vesiculation, weeping, and crusting. With few exceptions they responded dramatically to the use of normal saline soaks, similar to those for the treatment of burns. Very rapidly the crusts are removed, the weeping ceases, and epithelization occurs without delay.

Details of Technique

A white lint mask covering all affected areas is soaked in normal saline and applied to the face areas and covered by jaconet. It is essential to keep the lint moist throughout; this can be done by pouring on normal saline at frequent intervals. If the lint should become dry it is vital to soak thoroughly before removing. It is advisable to remove the lint from the face four-hourly, and to renew, so as to remove crusts. In some cases the face returned to its normal condition in 24 hours, and in all cases there was a rapid improvement. When the weeping areas have epithelized either zinc cream or 1% ichthyol paste should be applied.

A typical example is illustrated in Pte. A., aged 18, who was admitted to hospital on Dec. 4, 1942, two weeks after he was called up, having worn his respirator for 10 minutes the week previously, and again for 30 minutes three days before admission. The rash appeared 24 hours before he was admitted. He was suffering from a typical respirator dermatitis, affecting the forehead, cheeks, chin, and tip of the nose, all areas being covered with golden crusts. This case was treated with normal saline soaks in the manner described; after 24 hours there was a marked improvement, all crusts having disappeared, leaving a clean raw area. Treatment was stopped after 48 hours and the condition was cured in three days. Not all cases clear so dramatically, and most require a little zinc cream following the saline.

Comment

All these cases were moderately severe, affecting the contact areas of the face—viz., frontal, malar, masseteric, mental, and submental areas, with occasional lesions on the nose. Some cases proved more resistant to treatment than that of Pte. A., but comparison with other methods shows a marked advance. Another point of importance in the treatment is the advisability of not performing any patch test with rubber from the face-piece of the patient's own respirator until the skin is settling down or even healed, as a number of cases were aggravated by so doing; and even in one case after the skin was thoroughly healed the patch test caused relapse.

The saline technique seems to be the method of choice, and certainly takes precedence over those mentioned in the article quoted.

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Reviews

DIGESTIVE COMPLAINTS

Digestive Diseases in General Practice. By John H. Willard, M.D., F.A.C.P. Foreword by George Morris Piersol, M.D., F.A.C.P. (Pp. 449; illustrated. $5.50.) Philadelphia: F. A. Davis Company. 1942.

The state of the stomach is so largely a mirror of the state of the body and mind as a whole that Dr. Willard does well in this book to insist at the outset that when dealing with patients with digestive complaints it is essential to give adequate time to listen to "the often boringly detailed account" of symptoms, for by letting the patient talk the medical man will often learn much of his whole make-up. This should be followed by specific questions usually needed to clarify the position; the physical examination then takes place under appropriate conditions. All these steps are explained in simple, lucid language without undue insistence on minutiae, and the relevance of the various laboratory techniques is briefly considered. After this general introduction the various digestive diseases are regionally described, with excellent *x*-ray illustrations. Throughout, emphasis is laid on the simulation of organic disease by functional states, and on the aggravation of the former by the latter. The views as to the relation between gastric carcinoma on the one hand and peptic ulcer or gastritis on the other are judicially considered without dogmatism. Indeed, a distinguishing feature of the whole work is avoidance of the two pitfalls of undue dogmatism and inconclusive vagueness. Comparatively recent work such as Crohn's on regional ileitis receives adequate notice, but in general it is the ordinary things met with in everyday practice to which attention is chiefly devoted.

Three things are omitted that we should have liked to see mentioned: the use of the mercury tube for achalasia of the cardia rather than an expanding dilator; Murphy's sign for gall-bladder trouble; and the administration of insulin as well as dextrose in order to increase the glycogen content of the liver in cirrhosis. But these may be matters of opinion. An appendix of laboratory methods and diet tables concludes a really useful and practical book.

FORENSIC BLOOD GROUPING

Medico-Legal Blood Group Determination: Theory, Technique, and Practice. By David Harley, M.D., B.Sc., F.I.C. (Pp. 119; illustrated. 12s. 6d.) London: William Heinemann Medical Books. 1943.

Although medico-legal blood grouping has not been developed in this country, especially on the paternity side, to anything like its extent in other countries, yet we have produced the first monograph in English on the subject. Dr. David Harley, as he gracefully acknowledges in his dedication, is a pupil of the late Dr. Francis Martley, whose work in serology at St. Mary's Hospital made its department of chemical pathology known and respected throughout the scientific world. This book gives some idea of what the solid, patient work of Dr. Roche Lynch and its author have accomplished in the last twenty years. They have assisted the police in very many cases in which the grouping of blood stains, cigarette stubs, and the like could narrow the field of suspects. Owing to legal handicaps, they have not had the wide experience in disputed paternity cases that a similar department would have had in a Continental country. Nevertheless, Dr. Harley is able to analyse 65 cases of this class in which his department assisted; and what he does not recount is the indispensable part that it has played in evolving a technique which makes the evidence of its exponents unshakable in court, and thus in demonstrating practically to lawyers and legislators the value of blood-grouping evidence in paternity cases. Dr. Harley reprints the Bastardy (Blood Tests) Bill which Lord Merthyr introduced in the House of Lords in 1939, together with the highly favourable report made upon it by the Select Committee.

This volume contains in compact and economical form everything of value in the history, genetics, and serology of forensic blood grouping, and should be of the greatest use to all workers in this field. The sections on the ABO and the MN group systems and their heredity, and the theory of their judicial application, cover familiar ground, but do so with an ordered economy of language which makes reference easy. The technique of collection, testing, and interpretation which Dr. Harley describes has been thoroughly tested by daily use. The great interest of the book lies in its record of actual case-work, which shows strikingly the difficulties and disappointments of this class of investigation: in case after case the results are unhelpful, either through the insufficiency or contamination of the stains which had to be tested, or because the groups of the accused and the victim were the same. Now and again, however, the tests come into their own. A woman was found in a cellar dead from head injuries and strangulation. Blood stains were found on the watchman's jacket and cap, and he was suspected of the crime, but tests showed that these stains could not have come from the deceased woman, and so they did not connect him with the murder. In earlier days they might have been sufficient to hang him. Dr. Harley observes that the defence do not always seem to realize that the tests may exclude but can never identify, and so are far more the concern of the defence than of the prosecution. Their use will increase as lawyers come to know them better; and towards the spreading of this knowledge Dr. Harley's book will contribute greatly.

MAXILLO-FACIAL INJURIES

The Dental Treatment of Maxillo-Facial Injuries. By W. Kelsey Fry, M.R.C.S., L.D.S., P. Rae Shepherd, Alan C. McLeod, and Gilbert J. Parfitt. With foreword by Prof. F. R. Fraser, M.D., F.R.C.P. (Pp. 250; illustrated. 16s.) Oxford: Blackwell Scientific Publications, Ltd. 1942.

The authors of this book have had the opportunity of more extensive experience in the treatment of maxillo-facial injuries during the present war than the average dental surgeon of a civilian hospital receives in a life-time. This book, based on their own experience at the East Grinstead unit, describes in detail the methods of treatment which were devised during the last war and which have now been brought up to date in the light of that experience. The work is based on sound common sense and an intimate knowledge of general surgical principles. It is clearly and concisely written and the illustrations and diagrams are really excellent.

The reader may at first feel that the methods of treatment advocated are unnecessarily complicated, but war injuries of the face, with fractures often comminuted and with considerable loss of tissue, are so different from those of civilian practice that great ingenuity is essential to overcome the difficulties of treatment. Much that they describe could be done only at a specialized hospital, but the authors rightly insist that dental surgeons in the Forces must be cognizant with the methods they employ. One of the best chapters in the book, however, is devoted to field and preliminary hospital treatment and the more simple ways of treatment which are often satisfactory.

This book, which is a real contribution to a very specialized branch of war surgery, shows the good team work of the dental surgeons attached to the various maxillo-facial units.

SCHOOL HEALTH IN NEW YORK CITY

Solving School Health Problems: The Astoria Demonstration Study. Sponsored by the Department of Health and the Board of Education of New York City. By Dorothy B. Nyswander, Ph.D. (Pp. 377. $2.00 or 11s. 6d.) New York: The Commonwealth Fund; London: Oxford University Press. 1942.

In the light of previous investigations conducted since 1923 an intensive experimental Study of the School Health Service in New York City was launched in 1936 and completed in 1940. A report on the findings of the study by its Director now appears as a publication by the Commonwealth Fund.

The principal scene for the work of the study was the Astoria Health District, which was taken as representative of the city as a whole. Of the eighteen public elementary schools in this area, eight, with a total attendance of 8,000 children, formed the experimental field. Five of the eight schools had children from poor families. When the study began each child was due to receive two routine medical inspections in the course of its school career—the first on entering school and the second before leaving. The study staff made the experiment of abolishing the second routine inspection and concentrating, in its stead, upon the inspection of children of all ages selected as "cases" by their teachers and school nurses jointly. As a result of this change 67% of all children on school registers were brought under medical or nursing care. The conclusion was drawn that "the right children" were thus getting the attention they needed, and the method apparently is now in force in all New York schools.

The inspecting school doctors are on a part-time basis, most being in general practice. Other doctors in private practice provide treatment for referred cases at the parents' expense and, when requested, report to the school authority on the child's condition. Private practitioners may also submit reports on children due to begin school life.

Among the titles of other articles in this interesting report are "Teacher Participation," "Tasks of the School Nurse," "Medical Records," "Visual Acuity," "Loss of Hearing," and "The Care of the Cardiac Child."

Notes on Books

A third edition has now appeared of Miss MINNIE RANDALL'S book *Training for Childbirth from the Mother's Point of View* (J. and A. Churchill; 10s. 6d.). The author is the principal of the school of massage and sister-in-charge of the department of physiotherapy at St. Thomas's Hospital, and the post-natal exercises so well described and illustrated owe their beginning to Dr. J. S. Fairbairn, with whom she worked when he was in charge of the obstetrical and gynaecological departments. On his retirement Dr. Fairbairn urged her to widen the scope of this work to include pre-natal instruction. The aim and design of the exercises have been much extended since that time, and the pre-natal section is now based largely on Dr. Kathleen Vaughan's *Safe Childbirth*, and the exercises conform to the principles laid down by Dr. Vaughan. The section on relaxation is based on the teaching of the Archer Nerve Training Colony at King's Langley. Miss Randall makes full acknowledgment to these and others who have helped in preparing and rearranging the contents of this most useful and admirably illustrated book.

Vitamins and Minerals for Everyone, by ALIDA FRANCES PATTEE (G. P. Putnam's Sons; 10s.), is so simply written that almost any boy or girl of 14 years of age could understand it. Each vitamin and mineral requirement is treated separately and the best-known facts about it are stated in answer to questions—e.g., What does vitamin A do for us? What is vitamin A? How much vitamin A do we need? etc. The use of each vitamin is illustrated by a little story, always with a very happy ending. Useful tables of food values are given, and sample menus which would provide the daily requirements as set forth by the Committee on Food and Nutrition of the National Research Council, May, 1941. The information given is sound, and where evidence of the human being's need is not adequate—e.g., for vitamin E—that is clearly stated. The book is well printed and bound, and the reproductions of photographs of animals given and not given adequate supplies of each vitamin are very good indeed.

First Aid in the Royal Navy (H.M. Stationery Office; 2s.), in addition to covering the usual ambit of first-aid manuals, contains articles on the treatment of poisoning by the agents used in chemical warfare, of such conditions as immersion foot, phosphorus burns, and blast injuries, and on the movement and stowage of casualties. It is convenient in size and well printed and illustrated, and altogether an excellent production. Our chief criticism is that it lacks an index, which, in a first-aid book as full as this, is important as a guide to the appropriate chapter and verse required in an emergency. Efforts towards simplification have perhaps been a little overdone in some directions—e.g., to call the fibula the brooch bone seems rather to be straining at a gnat, while the definition of shock on page 4 reads strangely. Our sympathy is with the author, nevertheless, in the attempt to provide a simple definition of shock, and for the little book as a whole we have nothing but praise.

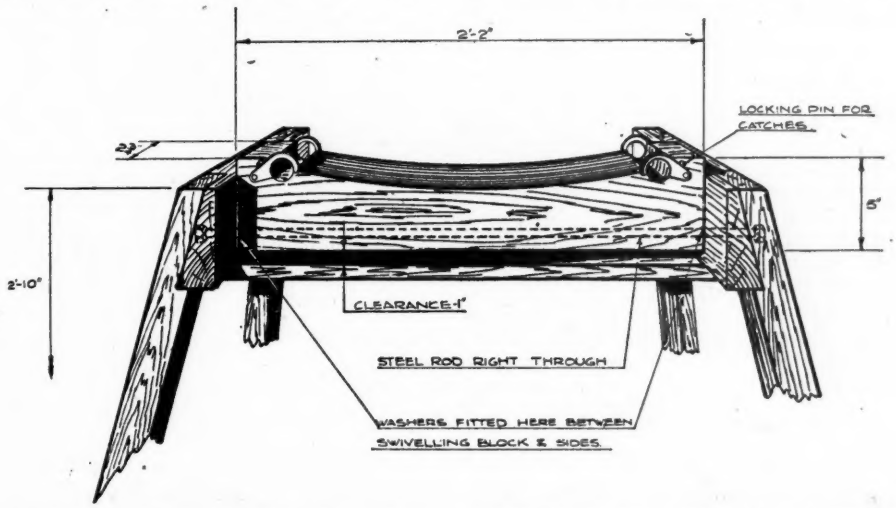
The *Dentists Register* for 1943 has now been published for the Dental Board of the United Kingdom by Constable and Co., price 15s., post free. The total number of names appearing on January 1 of this year is 15,192, being 96 more than the figure for 1942. All the new entries added were of persons registered as graduates or licentiates.

Preparations and Appliances

RESUSCITATION BY ROCKING

Dr. N. HOWARD MUMMERY, ex-chairman, Association of Industrial Medical Officers, writes:

Recent articles in the *Journal* remind us of the debt we owe to Dr. F. C. Eve, who is still actively engaged in investigating the physiological and mechanical problems his method of resuscitation involves. Being familiar with his original and rather cumbersome apparatus, and desirous of using the method for resuscitation at an aircraft factory where test pilots and cadets of an attached flying school are liable to come down in water, I designed a simple modification of the original some six months ago. Dr. Eve himself has tried and approved this and has urged me to publish the details in the hope that rocking resuscitation may become more generally available. Rocking, as Dr. Eve suggests, should be started at once in the rescue boat across the arms of two men facing each other with clasped hands and preferably with a third person grasping the patient's extended legs, and be continued by the Schäfer method during rapid transport to the ambulance centre, where he is placed on the rocking apparatus. While this is being used, at a speed not exceeding 10 cycles per minute with a four-second pause at the end of each stroke, the patient is stripped, rubbed down, blanketed, and other restoratives are applied.



Description of Apparatus

The apparatus consists of a wooden block 2 ft. 2 in. long, 5 in. high, and 2¾ in. thick, which is free to turn on a steel rod, transfixing both its base and the extended side pieces of a broad-based trestle 34 in. high. The upper surface of the block is hollowed to receive the sag of the loaded stretcher, and a semi-circular depression near each end receives the poles of the standard A.R.P. steel stretcher. The poles are held in place by metal claws, two on each side, which turn on a short axle passing through the wood block and held in position by locking pins. The metal bands holding the steel mesh of the stretcher to its poles prevent any longitudinal movement of the loaded stretcher. The patient's wrists and ankles are tied to the stretcher handles by clove-hitch bandages.

THE SUPPLY OF WATER TO RABBITS AND GUINEA-PIGS

BY

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The welfare of rabbits and guinea-pigs is an important matter in many pathological laboratories and research institutes.

There is a popular idea that rabbits and guinea-pigs "don't drink"; this is not true, as anyone can demonstrate by offering water to rabbits which have not had an adequate quantity of it in any form. Rabbits in captivity, when supplied with an abundance of fresh green food, may not drink water offered to them as such. Whatever the origin of the idea, it has given rise to a most unfortunate convention that rabbits and guinea-pigs can live on a very dry diet of hay and bran at times when shortage of greenstuff allows only a few leaves for each animal daily; if this is the only source of water the animals must suffer severely from thirst and will drink greedily from a bowl of water. Rabbits may show even less resistance than dogs to experimental anhydraemia (Marriott, 1923).

One is often told that the supply of water in bowls to rabbits and guinea-pigs leads to outbreaks of diarrhoea caused by fouling of the water. This danger may or may not be a real one; in any case the alleged danger does not alter the essential importance of a supply of water, and the remedy is not to deprive the animals of water but to find another way of giving it. A member of our technical staff here, Mr. P. J. Ewers, has taken part with me in some experiments on this matter.

Water can be supplied to rabbits and guinea-pigs in several ways which eliminate contamination. (1) Water, in a bowl of the kind generally used for dogs, which is not easily upset, is placed in each cage when the attendant carries out the daily cleaning and feeding, and is passed on to other cages. This gives, at any rate, a daily opportunity of drinking, and prevents acute shortage of water. (2) Some form of bulb or bottle, such as is used in most laboratories, certainly in most American laboratories, for rats and mice, can be employed if the cages provide a suitable attachment. (3) For poultry and cage-birds various sorts of water-vessel are used in which the risk of fouling of the water is very small—for example, some form of trough hooked to the side of the cage as high up as possible.

To obtain some data on the amount of water required by rabbits we placed two of the animals, weighing 2,650 g. (Rabbit A) and 2,080 g. (Rabbit B), on a quite dry diet of bran and clover hay, and supplied water by placing in the roof of each cage a bulb of water, of the kind holding 160–170 c.cm. which we use for rats.* The animals soon learned to drink from the nozzles, and after a few days the larger rabbit, A, would empty the bulb in a day, while the smaller drank rather less. After a week we placed a bowl of water in each cage: Rabbit A was not interested, while Rabbit B drank a little in a leisurely manner. Evidently they were not short of water, and their body weights had not altered. Hence a 2.5-kilo rabbit on a dry diet will take about 160 c.cm. of water, or 65 c.cm. per kilo, a day. This calculation provides approximately 4.5 litres of water for a man weighing 11 st., or 70 kilos; this is about twice the total intake of water in food and drink of an average human adult (Evans, 1941; *Macleod's Physiology*, 1941). This result provides a curious commentary on the doctrine that rabbits "don't drink." Possibly the rabbits which were the subject of this experiment took more water than was absolutely necessary. We find that guinea-pigs also drink freely from the glass bulbs, even when supplied with greenstuff. It is merely a superstition that rabbits and guinea-pigs have some special capacity for doing without water: there seems to be no reason why they should not drink as much clean water as they like.

* Made by Messrs. Howard Rawson and Co. Ltd., Devon Works, Farm Lane, Fulham, S.W.6. The bulbs are readily filled from a brass tube, with narrow side-tubes (made by Messrs. C. Hearson and Co. Ltd., 68, Willow Walk, Bermondsey, S.E.1), attached to the high-pressure water supply. An abundant growth of green algae in the bulbs is of no consequence.

The supply of greenstuff for animals is scanty at certain seasons, especially in the early spring, and now it is reduced by the increased human consumption and the sale of leaves which were formerly stripped off. A small handful of cabbage leaves, such as might be considered a good allowance for a rabbit, weighs 300 to 350 g. The fresh leaves of various kinds of cabbage contain from 80 to 95% of water. A rabbit which ate 300 g. of cabbage which actually contained 90% of moisture would receive 270 c.cm. of water. This is a liberal supply, and possibly such a rabbit would not drink, in accordance with the conventional doctrine about rabbits. But one must remember that greenstuff by the time it reaches the animals may have undergone considerable desiccation, which is often quite obvious. It seems much better, therefore, not to rely upon the variable water content of a variable supply of greenstuff, but to supply water as such at all times.

Rabbits which receive an ample dry diet and inadequate water probably suffer not only from want of water but from want of food. This is suggested by their poor condition and the scanty contents of the gut found post mortem, and by their behaviour when water is supplied. If one places a bowl of water before such an animal one may see that after a long drink it goes at once to the dry food and eats greedily.

The supply of water to rats and mice is referred to in several books which have appeared recently (Staff of the Jackson Memorial Laboratory, 1941; Griffith and Farris, 1942; Grüneberg, 1943). All three sets of authors take for granted that a constant supply of water is required. However, in some laboratories in this country, at any rate until recently, "moist" food with a variable amount of greenstuff was held to be a sufficient source of water. The dry foods were mixed with water or milk, and appropriate amounts of the mixture were squeezed by hand to a consistency which allowed a portion to be placed in each cage. This system is bad in principle because the supply of water is regulated not by the needs of the animals but by the extent to which the food happens to be squeezed by the attendant. So many ways of giving clean water are now available that the "moist" food system should be considered obsolete.

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REHABILITATION CENTRE FOR SCOTTISH MINERS

The rehabilitation centre at Gleneagles Hotel, Perthshire, was recently opened by the Secretary of State for Scotland, Mr. T. Johnston, M.P. A part of the hotel is still used as a hospital, for which purpose it was taken over at the beginning of the war, but accommodation has been found in it also for 200 miners (about 80 of whom are already in residence) recovering from industrial injuries, chiefly fractures. Dr. Macleod, the medical superintendent, is assisted by experts in remedial exercises, massage, and occupational therapy. What was formerly a luxurious sitting-room in the hotel is now a large gymnasium, where physical exercises are undertaken under the guidance of an ex-Army instructor; the most complete devices for physiotherapy have been installed, a swimming-pool and spray baths are in use, the entertainment side is not neglected, and, of course, the men undergoing rehabilitation have access to the beautiful grounds and surrounding country. This fitness centre, as it is called, is the result of a careful study by the Department of Health in conjunction with the Miners' Welfare Commission and the Ministry of Fuel and Power. The average duration of stay is about six weeks. The treatment and the courses are free and the travelling expenses of patients are met by the Miners' Welfare Commission. Mr. Johnston, in opening the centre, said that its prime purpose was to restore the men to their full working capacity as speedily as possible. In no way whatever was the service to be run as a means of relieving insurance companies of compensation claims. The patients are examined carefully both on admission and periodically during their stay, information of their medical history is obtained, and they are graded according to the activity of which they are capable. Their remedial exercises are adapted to their needs, and in the occupational therapy room they are encouraged under skilled supervision to work with their hands in wood, leather, and other crafts.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JUNE 19 1943

LABOUR AND STATE MEDICINE

The Labour Party has issued two pamphlets[1] setting out its post-war policy on national health services and on local government. There is little in the former that is likely to prove unfamiliar to readers of this *Journal*, and in outline the proposals for a national health service are similar to those recently put forward by the Ministry of Health and temporarily withdrawn. Any policy of the Labour Party in relation to health services has an obvious significance for the medical profession in view of the important part that will be played by that party in post-war England. Its views are presumably not without political effect at the present moment. As might be supposed, the Labour Party favours the introduction of a whole-time State salaried service, and all the arguments in the document before us are made to favour this conception. Its desiderata for such a service are that it should be planned as a whole, preventive as well as curative, complete, open to all, efficient and up to date, accessible to the public, equitable for the medical profession, and that it should be such as to preserve confidence between doctor and patient. The medical service, it declares, should be organized so as to enable the medical profession to "pull its weight effectively in all those tasks of democratic government which affect the nation's health."

While tribute is paid to the family doctor and the "great service he has rendered to the nation's health," and while his position as "friend and adviser as well as general physician" is sympathetically recognized, the pamphlet asserts that there is "only one way" by which existing difficulties can be removed—the employment of doctors as whole-time salaried officers in well-equipped health centres, thus providing for teamwork between doctors, better contact between general practitioners and specialists, and fuller access to all the resources of modern medicine. The family doctor is criticized as being "a sickness man rather than a health man," that he is out of touch with preventive medicine, that he cannot by himself provide a comprehensive service. The Labour Party adopts the same criticisms of the limitations of National Health Insurance practice as have been familiar to the B.M.A. for a number of years now. But it adds the criticism that "the panel system . . . does not provide sufficient guarantee for the efficiency of the doctors employed," and that the general public "lacks the knowledge for appraising the quality of his [the doctor's] service, and his efficiency is not in fact subject to any adequate control." It may be well to recall here the intention of the Medical Act of 1858. This Act was passed for the express purpose of regulating the qualifications of practitioners in medicine and surgery, through a General Council of Medical Education and Registration, which was to maintain and publish a *Medical Register* containing the names of those registered in accordance with the Act. The public was thus able to distinguish the qualified from the unqualified, and had the assurance that the training, knowledge, and technical skill of the former were under the supervision of the statutory body known by the short title of General Medical Council. The G.M.C. of course also exercises a disciplinary control over those guilty of professional misconduct. In addition to these safeguards there is the disciplinary machinery of the National Health Insurance Acts. It is common ground that doctors need to keep their professional knowledge up to date, and that one of the gravest disadvantages of present-day general practice is that most practitioners have neither the time nor the opportunity for postgraduate study; the B.M.A., in its latest report,[2] has suggested that when a national scheme of medical service is organized periodical "refresher" courses should be made compulsory. What additional restriction or compulsion the Labour Party wishes to place upon the individual doctor is not clear. The one specific complaint it makes against him is best given in the words of the pamphlet: "If he has a manner which ingratiates him with his clients, he can retain and even increase his practice, even though his technical competence may be very low." The pamphlet then observes that under the present scheme the doctor cannot speak "freely, bluntly, as a healer, or as a guardian of good health." Does the Labour Party seriously wish to maintain that ingratiating qualities will be absent in a whole-time service in which promotion depends largely upon the opinions of those employing the doctor? And is it not one of the commonest criticisms of local government medical services that the doctor employed in them not only does not speak "freely, bluntly, as a healer," but has in very many cases to submit to a censorship before he is allowed to publish anything at all on professional matters in professional journals?

The central authority in the service, as the Labour Party sees it, can be no other than the Ministry of Health, but a Ministry with extended powers covering all health services at present controlled by other Departments. In that respect the plan is more thorough than the tentative one of the Ministry. For local administration the country would be divided into regions, and in its other pamphlet the Labour Party indicates something of the character of those regions and the responsibility of their authorities. They must not be so large that a sense of common interest in their government will be lost, but they must be large enough to admit of development. One question which might be asked is whether Greater London, with an inner but very large county administration, and beyond it a still larger zone of unplanned and unrationalized urbanization, may be made into one homogeneous whole: the point is left in doubt. Each of the regional authorities would appoint a health committee, which would presumably be the body controlling the doctors. Nothing is said in either pamphlet about medical representation on these committees or about the setting up of separate medical committees. It must be inferred that the general practitioner and the consultant will be servants of the area authority in the same way as the medical officer: in other words, a new branch of the local government service will be created. The regional authority will have powers in respect of hospital and health centres, mental treatment, district and school medical services, the venereal diseases scheme, and nursing-home registration and inspection. Area authorities—an area being a division of the region, probably an amalgamation of urban and rural authorities, based where possible on county boroughs—will have

[1] *National Service for Health* and *The Future of Local Government*. Price 2d. each. The Labour Party, Transport House, Smith Square, S.W.1.

[2] Memorandum of Evidence by the B.M.A. to the Interdepartmental Committee on Medical Schools, *British Medical Journal*, June 5, 1943, p. 702.

powers in respect of midwives, maternity and child welfare, notification of infectious diseases, and vaccination. Most environmental health services will also remain with the area authorities. Within each region there will be a series of divisional hospitals for the treatment of all kinds of cases (except infectious cases and certain forms of mental disease). These will be general hospitals, each with from 600 to 1,200 beds, and staffed by perhaps fifty doctors. Although special hospitals will be eliminated, these divisional hospitals will have specialized units arranged in such a way as to prevent overlapping of services in any region. Linked up with the regionally organized hospital and specialist services will be divisional and local health centres—four or more local health centres in a divisional area, each centre served by a team of from eight to twelve general practitioners. It is well that those who have the interest of the voluntary hospitals at heart should be aware of the Labour Party's "simple method of achieving the goal of a unified hospital system." Voluntary hospitals will be given financial assistance in respect of cases referred to them by local authorities; the latter thereby become entitled to a share of representation and control on the governing board; the end-result of this will be that "before long the voluntary hospitals will come under the control of the local authorities, and the conditions of service of staff in all the hospitals will become standardized." As to the cost of the scheme, the pamphlet argues that it would cost little or no more than the present system.

In a very brief glance at the health of the nation the pamphlet rightly stresses the effect upon it of poverty and environment; and the statement of the Minister of Food that the nation in general is better nourished on its war-time diet than in peace is cited as an indictment of pre-war policy: "It means that the good resulting from improved distribution has outweighed the injury resulting from the enforced reduction of the national food supply." While this statement may be true in part, it ignores the possibility that such enforced reduction may in itself be beneficial. The effect of poverty, bad housing, and bad environment generally upon the health of people exposed to these evil influences is widely admitted. The matter is referred to in the Labour Party's pamphlet as the first item under the chapter heading, "Our Existing Medical Service." Are we to understand that there is therefore some connexion between the two, and to believe that a whole-time State medical service is the remedy? Is not the remedy to be found in the re-ordering of society rather than in the re-ordering of the medical profession? That reforms in the organization of medicine are needed, and what general direction these should take, are in the main recognized and agreed upon by medical men themselves. But the assumption that seems so widely prevalent in some lay and some medical circles that the men and women in this country are going to be turned into a healthy race through the instrument of the whole-time State doctor and an all-powerful Ministry of Health is, to say the least of it, facile. The doctors will remain the same men, with perhaps a diminished incentive to work, and their patients will (in some respects of health and sickness) remain the same men and women and children—unless they are guaranteed the basic necessaries of life in terms of food, housing, clothing, and recreation in return for honest work, with the safeguard against interruption of income which is the basis of the Beveridge proposals. It is reasonable, therefore, to suggest to our would-be political masters that the house should be set in order first, and the people in it fed and clothed properly, before calling in the doctor.

INFECTIOUS DISEASES AND SOCIAL CONDITIONS

It has been generally recognized for some years that the health of the community is related to environmental and social conditions. The extent of this relationship, especially in the group of infectious diseases, has been an important problem in public health administration. Farr, using large aggregates, first demonstrated in 1875 that mortality progressively increased with the density of the population per acre. The method used for the compilation of national statistics prevented a more thorough study being made, but during the past thirty years, as more details have become available, this subject has attracted much interest, particularly in relation to the infectious diseases of childhood. The trends of these have altered during the past twenty to thirty years—e.g., the changing age incidence of diphtheria and the decline in the death rate from measles.

An important modification in the presentation of vital statistics was made in 1911, when deaths were no longer allotted to the district in which they occurred but were transferred to the place of usual residence. From that date it became possible to compare the mortality of relatively small areas. Previously this could not be done, because, especially in some London boroughs, the death rate of a district was often seriously overstated by the inclusion of deaths in hospitals and institutions within its boundaries. The more detailed housing statistics, which permitted the construction of an overcrowding index, and the grouping of the various male occupations into five social classes which was introduced in the 1921 census, opened up further lines of investigation. Compulsory notification of certain infectious diseases and the gradual addition to these has brought morbidity as well as mortality within the range of inquiry. The statistics of notifications of infectious diseases are imperfect, because they are tabulated without regard to age and sex. For these details it is necessary to conduct a field investigation or to confine the investigation to areas where the local authorities record sex and age of the notified cases. The data for London have formed the basis of several inquiries, and the latest by G. Payling Wright and H. Payling Wright[1] considers the influence of social conditions upon diphtheria, measles, tuberculosis, and whooping-cough at ages 0–4 during the fifteen years 1924-38. The deaths from these four diseases form a large proportion of the deaths among pre-school children.

These diseases have varying epidemiological characteristics, but in all the principal method of spread is by infected droplets. Measles and whooping-cough are transmitted from child to child. Infection from adults is an important additional factor in the distribution of tuberculosis, and carriers are often responsible for the spread of diphtheria. As is well known, the mean age of infection varies for each of the diseases. The authors found that for diphtheria it was 6.3 years, for measles 4.4, and for whooping-cough 3.6 years. A high correlation was found between the mortality at ages 0–4, for the fifteen years, and the proportion living more than two to a room in 1931: the coefficients were for measles 0.838, whooping-cough 0.729, tuberculosis 0.670, and diphtheria 0.503. The relation between economic conditions as judged by the proportion of lower-paid male occupations was also highly related to mortality; the correlation coefficients were for measles 0.589, whooping-cough 0.452, tuberculosis 0.746, and diphtheria 0.591. The first two diseases are more highly correlated with substandard housing than with the social index, while for the other two the order is reversed. The authors

[1] *J. Hyg.*, Camb., 1942 **42**, 451.

conclude that substandard housing is the most important social factor concerned in the transmission of measles and whooping-cough, and that non-specific factors of resistance affected by poverty have little influence upon the outcome of infection. Not only is the mortality from diphtheria closely associated with overcrowding, but it appears that poverty may lead to a higher death rate in the poorer boroughs by lowering the non-specific resistance to infection. In addition to overcrowding, other conditions associated with poverty influenced the mortality from tuberculosis among young children. It is not yet possible, however, to determine how these operate, though factors such as food, clothing, and heating are concerned in maintaining resistance to tuberculosis. The comparisons which were made with the results obtained by other workers showed, on the whole, good agreement.

TREATMENT OF TUBERCULOUS CAVITIES

The treatment of pulmonary tuberculosis is based on two things: general measures to improve the health and resistance to the disease, and local measures to allow rest, relaxation, or actual compression of the diseased lung. If sound healing is to be achieved cavities must be closed, for their persistence carries with it an 80% chance of death within three years. Until a few years ago direct attack on a cavity was considered a surgical heresy, and those cases in which a cavity was accidentally opened during pneumonolysis were so often fatal that this attitude seemed well founded. The last five years has, however, seen the introduction and application of methods of external cavity drainage which are now sufficiently well tried to allow at any rate a preliminary report.

A substantial Continental and American literature already exists, and Sellors[1] and Maxwell and Kohnstamm[2] have lately recorded their experiences in two excellent articles which should be read by all who wish to know more of the treatment, especially in regard to the many important technical details of management. Although there have been attempts by earlier workers, the name of Monaldi will probably always be associated with the first satisfactory work on the introduction of closed-suction drainage for tuberculous cavities; the world-wide interest in the operation dates from his paper[3] presented in 1938. Two years after this J. V. Cussen described in this *Journal*[4] 3 cases treated by Monaldi's method, observing of it: "That remarkable and rapid improvement may be obtained would appear to be certain." In considering the treatment of a tuberculous cavity it is fundamental to understand the pathology of cavity formation, which up to now has been assumed to be directly due to actual destruction of the lung. Although tissue destruction is responsible for the beginning of a cavity, its growth and persistence are more influenced by mechanical factors—namely, thoracic-wall traction during respiration and inflation by air entrapped distal to an inflamed and partly stenosed bronchus. In other words, a check-valve action is set up, and every inspiration drives air past the valve to distend the small initial cavity of destruction into a large and still larger cavity. The denser tissue in its wall is generally due not to fibrosis, as is often thought, but chiefly to compression of surrounding lung tissue with some inflammation. The standard measures of collapse therapy, such as artificial pneumothorax and thoracoplasty, produce closure of a cavity in a high proportion of cases, but at times they fail or are impracticable. Moreover, the question must arise whether closure of a cavity can be achieved by something less drastic than thoracoplasty. Closed-suction drainage is a method which holds out hope in many difficult cases, chiefly of bilateral disease; but from the results of Sellors and Maxwell it does not seem likely that it will supplant thoracoplasty, though it becomes a valuable adjuvant to the operation by diminishing the size of the cavity and by improving the patient's general condition. Both Sellors and Maxwell conclude that the majority of patients so treated will need a thoracoplasty to obtain permanent healing. The introduction of the special fine catheter is a small operation carrying a virtually negligible risk. Gentle suction-drainage strikingly relieves cough—and this is very important when the cough is exhausting—and, in most cases, the cavity steadily shrinks to a small size or to no more than a tube track. Unfortunately, when the tube is removed the cavity often reappears, presumably by the very process of inflation via a bronchus by which it originally grew. This is not to be wondered at if the primary bronchial check-valve action persists. Thomas and his associates[5] have tried to overcome this difficulty by a most ingenious device—the injection into the cavity of some 10 c.cm. of the patient's own plasma. The object is to obliterate the causal bronchial fistulae, and the results in some of the few cases they report are both interesting and encouraging. Further experiences in this method or of others to produce bronchial closure will be eagerly awaited.

1 *Tubercle*, 1942, **23**, 239.
2 *Brit. J. Tuberc.*, 1943, **37**, 24.
3 *Ann. Ist "Carlo Forlanini,"* 1938, **16**, 665.
4 *British Medical Journal*, 1941, **1**, 115.

SKIN REACTION TO PHENOBARBITAL

Phenobarbital is one of the most useful hypnotics in general use, and since its introduction to the profession in 1911 has been a stand-by to both the general practitioner and the neurologist. Whereas barbitone (veronal) is a combination of two ethyl radicals with the molecular group which constitutes the residue of urea and is more properly known as diethylbarbituric acid, in phenobarbital one of the ethyl radicals has been displaced by a phenol group; hence the name. In former times phenobarbital was probably even better known under the trade name of luminal. It has been found to be of value in epilepsy, and often has advantages over other barbiturates as an ordinary hypnotic. But it possesses the drawback shared by all the members of this series in its liability to produce toxic rashes in susceptible subjects. Phenobarbital is a powerful narcotic poison and is even more toxic than barbitone, but it is not in the cases of acute poisoning that these toxic rashes occur. Very often they are seen when only a single small dose of the drug has been taken, and they are characterized by urticarial lesions of widespread distribution and by intense pruritus. They are usually recognized without much difficulty, and disappear quickly when the drug is no longer administered. Rarer and more serious are the eruptions which make their appearance only after phenobarbital has been given daily during a period of some weeks, with, at first at all events, no apparent ill effects. But when the skin is involved these cases can be severe and even fatal. The eruptions are characterized by exudation and exfoliation with ulceration of the mucous surfaces. Moss and Long[6] have reported two cases of this type: one in a woman who had taken about three dozen pills amounting in all to 1.53 g. of phenobarbital prescribed for the relief of menopausal symptoms, while the other was a negress who in the course of treatment for secondary syphilis took 30 mg. of phenobarbital four times daily for some forty days on account of insomnia and nervousness—her total dose was 4.8 g. Both these patients

5 *Brit. J. Tuberc.*, 1943, **37**, 44.
6 *Arch. Derm. Syph.*, Chicago, **48**, 386.

showed considerable fever, swollen lips, great redness of the conjunctivae, and copious sticky oral and pharyngeal exudate. The cutaneous eruption was generalized; in many places the lesions were crusted, and some of them haemorrhagic. Pruritus was intense. Both patients were extremely ill and appeared to be in great danger. But soothing applications and administration of large amounts of fluid—a treatment not at all easy to carry out owing to the dysphagia produced by the state of the mouth and pharynx and the copious exudation from the mucous membranes—led to complete recovery. At the end of three months no trace was left of the severe ordeal experienced. It is worth while to notice that in neither case were there any of the symptoms of narcotic poisoning such as commonly occur after single massive doses of the drug. This is the rule in such cases. Patients who have taken a single massive dose show no cutaneous symptoms, while those who suffer from the cumulative effect of a series of doses show no nervous symptoms. Moss and Long draw attention to the strong resemblance between these cases and certain others labelled "atypical erythema exudativum multiforme," of unknown cause. They suggest that phenobarbital (or perhaps some allied barbiturate) may well have been the real cause in many of these. A history of drug ingestion is often difficult to obtain, and it is still more difficult to ascertain the name of the drug used.

THE DETERMINATION OF BLOOD GROUPS

Blood transfusion disasters may be caused by faulty grouping. Owing largely to the apparent simplicity of making the tests the standard of accuracy of blood-grouping results is not as high as it might be. It is most unfortunate that, without any immediately obvious difficulty arising, blood-grouping tests are often left, after a few minutes' instruction by a teacher far from experienced, to a person quite unused to laboratory methods. Accurate grouping is not simple, and if errors are to be avoided certain technical principles must be understood and adhered to. There are three essentials: a sound and well-controlled technique; good and reliable reagents; and, last but not least, an experienced worker. The appearance of an M.R.C. War Memorandum[1] on "The Determination of Blood Groups," describing these principles and essentials, is most welcome. Three methods of grouping which in trained hands have given satisfactory results are described, and their relative merits are discussed. It is recommended that one or other should be used by all workers without the introduction of personal modifications. Of these three it is said that where possible the tube method should be employed; if this is impracticable a tile method in which the red cells are used in weak suspension is advisable; and that a tile method in which undiluted blood is added to grouping serum is not advised unless the worker has very considerable experience of this particular procedure. The importance of directly matching the donor's cells against the recipient's serum is stressed. Sources of grouping errors are analysed, and the properties and storage of testing sera are detailed. It really is worth an effort to store fluid sera frozen solid, and where this cannot be done dried grouping serum is recommended. The most important statement in this 19-page document stands on page 4: "It is certain that if the serum were regularly examined for agglutinins, as well as the cells for agglutinogens, most blood-grouping errors both technical and clerical would be prevented." No worker seriously seeking accuracy can ignore this, for it seems impossible to group any considerable number of people by any technique that examines only the agglutinogen content of the red cells without mistakes arising. A section on the subgroups of A, which most workers find so baffling, should help towards a clearer understanding of this admittedly confused aspect of the blood groups. There is an excellent and most useful note on the recently discovered Rh factor. The memorandum sets out in a comparatively small space a large amount of essential information which anybody who has blood-grouping tests to make should study and digest.

[1] M.R.C. War Memorandum, No. 9. H.M.S.O. 1943. (4d. net.)

A COUNTY BOROUGH IN THE FRONT LINE

The county borough of West Ham, with a population (pre-war) of 300,000, was the first part of the metropolitan area to feel the fury of large-scale air raids. On a September afternoon in 1940 two of its poorest districts, Canning Town and Silvertown, were attacked by incendiaries, and the glow of the fires so lighted guided the bombers which came later the same night. Casualties were astonishingly few, but hundreds were rendered homeless, and an immense emergency problem was created in a matter of hours. *War Over West Ham*[1] is an investigation of the reactions of such a calamity upon the people, the local government, and the social services, and Miss Idle has done her work with Fabian thoroughness. West Ham, though burdened by early slum development, is a progressive borough. To take its health services alone, it has five municipal and six voluntary maternity and child welfare clinics and four school clinics. Only half the county boroughs in England pay midwives' fees in necessitous cases, but West Ham is one of them. Fewer than half provide artificial sunlight treatment or special schools for mental defectives, but again the number includes West Ham. The organization and experience behind these and other services were of great value when the test of the emergency came. Nevertheless, Miss Idle is critical of the borough council, apparently on the ground that the average age of its members is about 60, an indictment—if it is one—which might be brought against many local and national bodies. In A.R.P., she says, the council moved slowly, did not grasp significant factors, was fearful of being by-passed, was obsessed with municipal prestige. Even when it provided the services it had no notion of advertising their availability. She wants young men and women, not people past their prime, in the administration of such a borough. Some of her criticisms are eloquent with the wisdom which comes after the event, and it seems probable that the council might construct a rather different narrative of what happened. Before the authority is censured it ought in fairness to be remembered that it was the first to have to deal with such a situation, and that even though there were delays and unsatisfactory co-ordination in some respects, many services, including the medical ones, made without difficulty fundamental readjustments to meet the emergency.

Of the large numbers of men who have qualified for the medical profession in Northern Ireland since 1938, three out of every four have volunteered for the medical branches of the fighting Services. Almost all of them enlisted immediately on completing their statutory six months' residence in a hospital. So many members of the medical staffs of the Ulster voluntary hospitals have joined up that it has been possible to carry on the work only by bringing back from retirement former senior members of the staffs.

[1] *War Over West Ham. A Study of Community Adjustment.* A report prepared for the Fabian Society and the Ethical Union by E. Doreen Idle. Faber and Faber. (6s.)

Reports of Societies

NUTRITIONAL PROBLEMS OF INFANCY

In wartime the "susceptible" classes—expectant mothers and infants—need special nutritional care. The Nutrition Society's recent meetings are therefore of special interest. A symposium on nutrition in pregnancy has already been held, and on May 22 there was a conference on nutrition in infancy. A discussion on milk will take place on July 5.

One of the virtues of these meetings of the Nutrition Society is that they bring home to those who attend them just how little accurate information on nutrition is really available: this was obvious at the recent meeting on nutrition in infancy. Many speakers stressed that the baby has no way of telling us how it feels and what it would like. As Dr. H. E. Magee in the afternoon session put it, the baby's response to all discomfort is to "howl." Dr. HELEN MACKAY quoted the work of Dr. Clara Davis in America, who had let 12 babies choose their own foods. Many of the things they ate and did not eat would have probably horrified either the nutritional expert or the baby specialist—or both. The consumption of ten eggs at a sitting or the failure to take any milk at all for some months were examples of their selection. But all the babies appeared in a state of optimum nutrition at the end of the experiment.

Some Useful Pointers

Dr. Mackay said that in feeding babies three things had to be borne in mind: (1) the tolerance of babies to food; (2) the importance of gradualness—the education of the child to take many kinds of foods if they were given gradually; (3) the importance of early supplements, as babies kept on a milk diet for one year were often retarded. Comparing the recommendations of the American Committee on Food and Nutrition on the requirements of various nutrients in infancy, Dr. Mackay showed that they were higher than those usually adopted in this country. She believed that the American Committee must in some cases have been thinking of artificially fed babies.

Taking various nutrients one by one she made the following points. In breast-fed babies only 10% of the calories came from protein. Milk was the sole source of the baby's protein, whereas some of the fat and carbohydrate might come from elsewhere. The casein of cow's milk was not as good as the lactalbumin of human milk, but the milk of most animals had a higher protein content than human milk because the young of these animals grew more rapidly than humans. As human milk was relatively low in protein it was probable that in rapidly growing babies (e.g., prematures) the protein of human milk was insufficient. In some places it was customary to give protein to such babies, but not to any great extent in this country. Dr. Mackay was doubtful of the value of such a procedure.

The infant's requirement for calcium was important, but it was difficult to give minimum requirements because they were variable. For example, in a full-term foetus the long bones had a considerable amount of cancellous tissue, and it had been suggested that a baby could draw on some of this calcium. The difficulty of preventing rickets in some premature babies suggested that this might be a fact, as the premature baby would have such a small amount of cancellous tissue to constitute a calcium reserve.

Vitamin D varied considerably in the diet of infants. Babies which were put out of doors regularly throughout winter rarely developed rickets, for, hard to believe though it was, even winter light in this country had some protective action. Premature babies in particular needed vitamin D very early in their lives. Dr. Mackay recommended a routine dose of vitamin D for all babies, which would protect against rickets under all circumstances. One point of special interest made by the speaker was that the vitamin D of concentrated preparations was relatively poorly utilized. Of the other vitamins, little was known of the requirements of vitamin A or of the B complex. The American Committee on Food and Nutrition had recommended 30 mg. per day of vitamin C, although this was probably more than was needed. The fact that vitamin C appeared to be associated with the metabolism of certain amino-acids, particularly in premature infants, suggested that it would be wise to ensure an adequate supply of it.

Most babies had a low level of haemoglobin (which was cured by iron) at the end of the first year. It seemed desirable, therefore, to provide babies with medicinal iron and foods rich in iron in the latter half of the first twelve months of life.

It was important for an infant to have plenty of water and to ensure that it received sufficient *quantity* of food. The latter was sometimes overlooked, as many of the symptoms of hunger often went unrecognized.

Many speakers contributed to the discussion of this paper, but space cannot be given to their contributions, valuable though they were. We should mention, however, some interesting figures given by Dr. S. K. KON of the National Institute for Research in Dairying on the vitamin content of human milk. His figures were obtained from 1,000 samples: vitamin A, 700–850 I.U. per pint (there is little variation in this figure); vitamin C, 12 mg. per pint in winter, 24 mg. per pint in summer; vitamin B_1, 0.07 mg. per pint; riboflavin, 0.13 mg. per pint—this was low compared with cow's milk, which has six times as much.

Wing Cmdr. R. W. B. ELLIS'S discussion of the methods of assessment of underfeeding, rickets, and scurvy was extremely helpful and stimulating to all present. Dr. ALAN MONCRIEFF opened his paper with a few unequivocal comments on the misuse of the term "marasmus." He contended that the best way to cut into the vicious circle malnutrition–infection–malnutrition was primarily to treat the infection. He emphasized the point, also made by other speakers, that the bogy of overdosage with vitamin D really was a bogy. One case of his of vitamin-resistant rickets had been treated with half a million international units of vitamin D daily for 6 weeks with no effect on the rickets or on calcification in other parts of the body. He stressed the fact that preparations of cod-liver oil and malt which rarely contained more than 10% of cod-liver oil could not be regarded as either a preventive or a cure of rickets.

Administrative Aspects

The morning session had been devoted to a consideration of the scientific aspects of infant nutrition; the afternoon session, to a consideration of administrative problems.

Dr. J. C. SPENCE made a plea for the provision of separate departments for maternal and child welfare, because each was such a big subject in itself. In the subsequent discussion this was regarded as being perhaps not desirable, because from the standpoint of nutrition the two were indissolubly linked. Dr. Spence believed that some better way must be found of giving technical advice to mothers. He believed that advertisements for patent foods should be controlled.

Dr. H. E. MAGEE, in a thoughtful paper on the public health aspects of infant nutrition, claimed that we should strive towards the ideal of optimum nutrition. He believed that the national milk and vitamin schemes were one of the most important public health measures which had been taken, and he hoped they would be continued. The war had provided us with a unique opportunity to test out nutritional theories, and they had come through with flying colours. Mr. F. LE GROS CLARK, secretary of the Children's Nutrition Council, supported Dr. Magee's comments on the milk and vitamin schemes, and pointed out that they constituted an important precedent, as for the first time food was being distributed according to biological requirements regardless of income.

One matter stood out through the whole of the conference—agreement on the importance of breast-feeding.

The chair at both morning and afternoon meetings was taken by Prof. L. G. PARSONS, professor of children's diseases, University of Birmingham.

At the annual general meeting which preceded the afternoon session Sir John Orr, Dr. L. J. Harris, and Mr. A. L. Bacharach were re-elected chairman, hon. secretary, and hon. treasurer respectively of the society, and Dr. S. K. Kon was elected hon. editor of the Proceedings of the society. In the election for membership of the committee there were five candidates, and Mr. F. Le Gros Clark, Prof. S. J. Cowell, Dr. A. P. Meiklejohn, and Dr. Lucy Wills gained the vacant places.

Correspondence

The Cult of Negative Health

SIR,—In opening the debate in the House of Lords on May 5 Lord Geddes stated that the physical condition of evacuees was better than that of city dwellers in his youth, but that both adults and older children were to a surprising extent lacking in independence and convinced that they were not well. He noted a similar contrast between the conscripts of this war and the young men who served in 1914 and in the Boer War. He further stated that the children, at any rate, had improved greatly through living in the country.

These observations are of great interest, but I think we shall have to look beyond the Government official and the medical profession for the explanation of this cult of negative health. Moreover, since an improvement in physical health appears to have occurred side by side with a deterioration in mental health (which loss of independence and belief in ill-health surely indicate), it would be reasonable to look not to the defences of the body but to the sphere of mental life. I would like to make the suggestion that this belief in ill-health may to a large extent be due to the fact that, in the case of the town dweller, the environment does not *demand* the use of more than a portion of his interests, abilities, and energies.

Biologically speaking, we are animals. Animals could not survive in the struggle for existence unless they learned to satisfy their needs in the most efficient way. In common with animals we have an innate tendency to get what we want with the least possible expenditure of energy. Habit-formation—learning to do things without thinking—is only a part of this economy of effort. The tendency to provide for our requirements by the easiest and quickest means can and does influence a high proportion of all our behaviour. The newly born infant uses practically all its psychic and physical energy in the maintenance of life and in growth. It lives to a very large extent in an inner and sensory world, and is intensely aware of bodily sensations. This condition, though probably unpleasant, is biologically necessary. In physical illness, energy and interest are withdrawn from the outside world. The sick person retreats into himself, and becomes, in this respect, like a baby again. He is acutely conscious of physical sensations and is using all his energies in combating the disease. This turning inwards is again of obvious value. In normal health, however, there is a surplus of psychic and physical energy over and above that required to maintain bodily functioning and growth. Whether this excess promotes or lessens physical and mental health depends upon the way in which it is utilized.

Here is the problem. In most people the tendency to economy of effort has, on the whole, a greater influence on conduct than has the amount of energy and interest actually at their disposal. Unlike children, relatively few adults will tackle a difficult intellectual or practical task just for the pleasure of doing so. The zest of the struggle, the triumph of achieving success in the face of obstacles, the enjoyable release of energy and creative ability can be observed in any normal and healthy 4-year-old, but is all too soon forgotten, and many people go through life with practically no knowledge either of their powers or of the satisfaction to be gained by using them.

Any emotional or physical drive, capacity, or ability which is constructively used brings about an increase in physical and mental well-being. Lack of use is, from the psycho-biological point of view, not a passive but an active state. The surplus energies and drives are *there*—but they are invested in the individual himself. He returns to a state appropriate to physical illness or to infancy, becomes morbidly aware of bodily functioning, and feels ill and helpless. Even this, unfortunately, is not the end of the story, since there are many clinical, pathological, and *x*-ray proofs that the over-investment of energy within the organism sooner or later causes organic dysfunction and "real" illness. The human organism is, then, like the U.S.A. after the last war, sick of a surplus of gold which it could not use.

The country housewife is, I believe, inherently no wiser than the townswoman. The former would be only too pleased to have labour-saving devices, ready-made entertainment, and a fried-fish shop round the corner. If she is more resourceful, ingenious, and competent it is because she has *had* to "make do." She has found Necessity a benevolent if stern goddess; she has achieved mental health in spite of herself and not because she has realized the value of her manifold and often harassing duties. I therefore find some of the trends of post-war planning very disquieting. I am no more in favour of slum housing conditions than I am of monotonous routine work in home and factory, but the constant emphasis on making life easier is distinctly ominous. Broadly speaking, if we plan a post-war world to give us more leisure and less practical problems in our daily life we shall, I believe, plan for mental ill-health.

We are to-day living more simply, working harder, and experiencing greater deprivations than at any time in recent years. We are learning to make and grow what we cannot buy—and, during the war, the national health has improved. Can we maintain this improvement? It is my belief that we shall not do so unless we so plan that the vastly increased output of energy and ability necessitated by war conditions is no less imperatively demanded of us in times of peace.—I am, etc.,

The Tavistock Clinic, London, N.W.3. R. E. LUCAS, M.B.

Medicine and Politics

SIR,—Any trained scientific observer who reads the article under the above title in your issue of May 29 (p. 673) will be forced to the conclusion that its author must have been a politician when very young and had a really bad fright!

A good many doctors with whom I have discussed the matter have confirmed my own experience, that when a practitioner is returned to Parliament for the first time he is greatly surprised at the distrust of the medical profession among the members generally. At first he feels a little hurt, because he knows that he belongs to the most self-sacrificing and public-spirited of professions; but his disquiet is usually short-lived, for he soon discovers that the distrust of the profession is solely the result of ignorance. Should a politician take the trouble to read Dr. Geoffrey Bourne's article he would, I have little doubt, go through exactly the same mental process and reach a corresponding conclusion.

For politicians are very much like other people—no better and no worse. Very few go into politics for purely selfish reasons. They become politicians because they want things done, just as Dr. Bourne is concerning himself with medical politics because he wants something done (or is it something not done?). Most politicians believe that what they are wanting done is for the good of the nation; but some take a more limited view, and are mainly concerned with the welfare of the class to which they belong. But even these believe that what they are trying to do is in the national interest, because they regard their class as of the greatest importance to the nation, and I have no doubt that Dr. Bourne looks upon the doctors in exactly the same light.

It is because politics is only a means to an end and not an end in itself that people of every sort and kind, and with the most varied outlook, find themselves compelled to become politicians. It is absurd, therefore, to generalize about politicians, and consequently such statements as "intellectual activities are not encouraged by politicians" are the most arrant nonsense.

When Dr. Bourne tells us that "history proves that scientific freedom and research are of vastly greater importance to humanity than is administrator" he is on much firmer ground. The administration must undoubtedly take second place, but the value of his work is real; indeed it can be truly said that, in a complicated civilization like our own, the results of scientific research cannot be applied without him. Few of us who are practising medicine can lay claim to the discovery of more than a few of the methods of diagnosis and treatment we use daily; nor is it always possible for us to apply these in accordance with the methods of an exact science. We are compelled, therefore, to act as administrators or politicians, doing the best we can for our patients in all the circumstances of the case. And thus we demonstrate in our daily life that the scientist and the administrator can work successfully together.—I am, etc.,

Northwood, Middlesex. SOMERVILLE HASTINGS.

SIR,—In the summing-up of his article on "Medicine and Politics" in the *Journal* of May 29 Dr. Geoffrey Bourne makes a number of points with which most people will agree. The body of the article, however, which is chiefly concerned with a plea for the protection of medical scientific research from political administration, calls for some comment.

Let us suppose that a system of State medicine were introduced. Quite apart from the consideration of whether it might improve the application of existing medical knowledge to the people as a whole, the situation would arise in which ill-health would at once become a *direct* burden on the national income. Even the most ignorant of administrators would be anxious, to put it least charitably, to minimize this burden. In this case the medical profession would have all the cards to play, for the advances in the control and cure and prevention of disease made by medical science are striking enough to convince any chairman, councillor, M.P., or trade unionist—once the facts have been properly presented. (The accusation of ignorance levelled by the medical profession against laymen, though often deserved, is nevertheless largely the profession's fault—for when has it seriously attempted to dispel this ignorance?)

It would be surprising indeed if medical science was not given at least quantitative encouragement under State medicine. As for the quality and freedom of medical science, would the existing places of research be closed and their workers dismissed? Obviously not, nor would those who at present direct or influence research cease to do so. Dr. Bourne, if he expects that State medicine will come, should surely lay less emphasis on safeguards and more on the positive contributions which medical science will make as facilities for it are increased. For freedom must justify itself, and be justified of those who claim it.

It is quite likely (though not certain) that under a State medical system facilities would be more readily available for working on the more common but difficult diseases such as rheumatism, rather than on rare and "interesting" diseases—that is, there would be, in an important sense, a restriction on "freedom" in medical science. Provided that the restriction were relative only it might well be entirely beneficial to the progress of medicine, and, since fundamental processes are not confined to particular diseases, it need not impair the growth of fundamental knowledge.

It is true enough that at present the volume of research done in voluntary hospitals is greater than that in their municipal sisters. Some of the big teaching hospitals have a good tradition in the matter, they have built-in facilities, and they are attached to universities. Where there are whole-time research workers, however, these are usually paid not by the hospitals but by the universities or by the great research foundations. There is no intrinsic reason why such persons should not be attached to county or municipal hospitals. That research is even now carried out quite extensively in these places can be seen by anyone who looks through the sources of papers in the medical press. I myself belong to a county hospital service which has its own active medical society, and its own entirely democratic research committee whose sole aim is to encourage and facilitate research. We can stand up to administrators, for there is fundamentally no conflict of interest.—I am, etc.,

J. H. HUMPHREY.

SIR,—Dr. Geoffrey Bourne claims that medical research is restricted, if not actively discouraged, in the municipal services. This is certainly not true of tuberculosis. The output of original work from State-controlled antituberculosis services, both in this country and in the U.S.A., far surpasses in quantity and is not inferior in quality to that issuing from voluntary institutions. This research is not, indeed, promoted in most instances by the administrators of the service, but is the spontaneous product of doctors' curiosity, set down and worked out in their leisure time. So is the majority of research in general medicine, as reference to contemporary journals will show.

Certain problems do call for high-powered teams with special training and equipment; but investigation in the field is still, and I hope always will be, the part of clinicians with their eyes open, the sum of whose observations can, if so desired, be collected and statistically correlated. Only large organizations can provide the large figures often necessary, and I should like Dr. Bourne to cite any instance where lay members of a local authority have obstructed a reasonable project of this nature. Certainly the Middlesex County Research Committee, which has as its field the county's two million residents, met at its inception no discouragement from its authority, and has so far retained completely that intellectual freedom so valued by Dr. Bourne, tempered by a scrupulous accuracy that he would do well to emulate.—I am, etc.,

BRIAN C. THOMPSON, M.D.

State Subsidy for Medical Education

SIR,—In the letters in the *Journal* concerning a State Medical Service there is one point which your correspondents appear to have overlooked—namely, subsidization of medical education by the State. Immediately after the war, and in any case later, if an unacceptable service is forced on the profession there will be a shortage of doctors. The authorities would no doubt meet this by subsidizing medical education, which in a decade would flood the medical profession with a crowd of docile but undesirable members. A similar method was used after the last war to replenish the ranks of the teaching profession, with, in the opinion of many, unfortunate results. So soon as entry into the profession is made easy, and so soon as one forgets that to be a doctor is "a way of living" and not merely a safe job with a fixed salary, then so soon will medical standards deteriorate.

One other point. One notes repeatedly in correspondence and debates the assertion that State service does not paralyse individual effort, and examples are quoted of outstanding achievements by medical officers in the Forces and in the Colonial medical services; but are not these exceptions? No mention is made of the more usual case of the medical man tied down to an uninteresting routine who, by the time he realizes that he must get out or remain an official for life, finds that his medical talents have passed away and that he is no longer fitted for civilian practice.—I am, etc.,

Knighton. G. H. H. BOOTH.

Selection of Medical Students

SIR,—In the B.M.A. memorandum on medical teaching (June 5, p. 702) I notice that it is recommended that prospective medical students should be interviewed by a small committee to determine if they are suitable "human material" from which to make future doctors. Is this process of selection to be restricted to the medical faculty, or is it logical that it should be extended to law, engineering, science, etc.? If so, where is the freedom of the individual to be found? At present the Ministry of Labour "directs" persons to a "suitable" occupation. Is this the sort of thing we are still to be subjected to after the war? It would seem that the committee's recommendations may extend further than was realized.—I am, etc.,

Rhyl. J. C. L. DAY.

The Raw Milk Danger

SIR,—Papers and correspondence recently have brought to the fore again those two vitally important factors in child health—viz., breast-feeding and the boiling of cows' milk. They can hardly be too often stressed, and though the great majority of the profession are convinced of their desirability, do we insist on them in our own local concerns, or voice our convictions sufficiently loudly?

I am not here concerned with our shortcomings in encouraging natural feeding, but to ask how our consciences stand in regard to milk. That supplied in schools is not compulsorily boiled to start with. Surely we should insist that this is done, except in the few areas where a pasteurized supply is available. And how about hospitals? Is it the rule for all milk to be boiled? No.

Eventually we hope pasteurization will be universal, but until then a lot might be done by school officers and hospital residents if they would just inquire into the state of affairs and protest firmly if they find raw unboiled milk being supplied to the children. The G.P., too, might do more propaganda about this than he does; in fact he sometimes even discourages boiling. What is the conscientious mother to do when her *Nursery World* persistently exhorts her to boil the milk and her doctor says it doesn't matter?

I think one of the reasons for the general lack of realization as to cause and effect in bovine tuberculosis is the doctor's

attitude to an established case, say, of glands in the neck. He seldom inquires about the milk supply, but murmurs something to the effect that "there's a lot of this about; children don't get enough butter and fresh fruit these days," unwittingly giving the impression that dietary deficiencies can *cause* the disease. Or maybe he does not like to assert the medium of the infection for fear of upsetting the parents, who may feel he is accusing them of negligence.

Until we make a plain statement (and act accordingly) that every child with bovine tuberculosis has at some time drunk raw milk and that *this* has caused the disease we shall not be doing all that we might to prevent this wholly preventable illness.—I am, etc.,

Stourbridge. JOYCE MCCARTHY.

Aspirin and Gastric Haemorrhage

SIR,—Under "Any Questions?" in the *Journal* of June 5 (p. 714) a question as to whether aspirin can give rise to gastric haemorrhage is answered in the affirmative, and reference is made to the "convincing" evidence brought forward by Douthwaite, Douthwaite and Lintott, and Hurst and Lintott in 1938 and 1939. In the same number (p. 689) Dr. Avery Jones analyses 171 cases of haematemesis and/or melaena recently under his care. Of these, 22 were diagnosed as acute ulcer, 2 as acute gastritis, and in 34 the diagnosis remained uncertain; together these made up 35% of the whole series.

From my experience in hospital and private practice since Lintott and I wrote our paper in 1939, I would expect to obtain a history pointing to aspirin as the direct cause of the haemorrhage in at least one-half of the 58 cases in which chronic ulcer, carcinoma, and cirrhosis of the liver could be excluded. The association is never recognized by the patient himself and is discovered only after a careful cross-examination. It is then found that in a period when the patient is completely free from indigestion he has swallowed one, or more commonly two, three, or more aspirin tablets, either whole or broken into a few fragments, generally with water, occasionally alone, and always on an empty stomach, in order to relieve headache, "rheumatism," or some other pain or discomfort; and that the haemorrhage followed within a few hours. In many cases he has never taken aspirin before or not for many months or even years, and never more than one tablet at a time and then perhaps only after meals. In several instances earlier attacks of haemorrhage could be traced to the same sequence of events—headache, aspirin, haemorrhage. Other proprietary tablets, such as veganin, which contain aspirin, are of course equally dangerous. I have also seen a few patients with chronic gastric or duodenal ulcer in whom the history pointed to the probability that a recent haemorrhage without the usual preliminary digestive symptoms was caused by aspirin.

I believe that the risk of haemorrhage after taking aspirin would be negligible if it were always taken in powdered form and after meals, with 10 gr. as the maximum dose. If all manufacturers of aspirin were to print instructions to this effect on the bottle labels the incidence of haematemesis and melaena in the absence of chronic ulcer would probably be reduced by about 50% and the total incidence by 15 to 20%.—I am, etc.,

Oxford. ARTHUR HURST.

Shortened Puerperium

SIR,—Dr. Flew made an admirable reply (June 5, p. 707) to Dr. Denys Smith (May 22, p. 644), who wishes to shorten the puerperium by way of solving the problem of shortage of maternity beds. I should like to support Dr. Flew from many years' experience in maternity and child welfare clinics. Dr. Denys Smith asserts that the majority of working-class mothers who leave the maternity hospitals on the tenth day are "fit and well." I wish he could see some of them a few days afterwards! It is a typical and common experience of mine to be consulted by such a nursing mother when her baby is two or three weeks old, complaining that "my breast milk began to go when I first got about again." She looks pale and anaemic, is obviously debilitated, and I find on inquiry that the lochia are present still and sometimes profuse.

In pre-war days, when the services of a municipal home-help could be procured, it was sometimes possible to get such a patient to bed again in her own home for a few days with excellent results. The lochia would cease, breast-feeding would be re-established, and afterwards she was able to resume her household duties and nurse her baby. Ten days only in hospital is too short a time for the mother who has to return to her home and household duties, with little or no domestic help, if "the normal but considerable processes of involution and repair are to take place," as Dr. Flew says. This applies equally nowadays to many an upper- and middle-class mother leaving the haven of the nursing home for a house or flat—with only fortuitous domestic help.—I am, etc.,

London, W.14. MARY KIDD.

SIR,—I feel I cannot accept Dr. Neal Smith's advice to shorten the puerperium. No definite evidence is offered to show that some cases of prolapse and backache are not due to early rising after labour and quick return to full activity. His reason for keeping mothers in bed at all appears to be on account of heaviness of the breasts until the fifth day. If this is the case, why should mothers stay in nursing homes for as long as a fortnight?

Some reasons for rest in a reclining position for longer than five days after labour occur to me. Throughout the animal kingdom the period following reproduction is one of rest. The stretched pelvic joints, ligaments, and muscles need time for repair, and can hardly be expected to support a heavy uterus while the mother tries to resume an active life. The time taken for this repair must vary with the individual and the type of labour. From my own experience of three puerperia and from questions put to other mothers I have noted that the unsupported feeling about the pelvis takes longer to pass off than any feeling of weakness in other parts of the body, in spite of exercises.

The distended venous system of the lower limbs and pelvis also needs time for shrinkage. To throw extra strain on it by the premature assumption of the erect attitude encourages the formation of thrombosis and emboli, as well as subinvolution of the uterus. The replacement of fluid lost as sweat and blood during labour needs adequate time to allow for satisfactory lactation. Taking the patient out of bed is likely to pool blood in the lower part of the body and so decrease the flow to the breasts. Mild exercises for the arms and upper trunk would seem to be more useful.

Surely in these enlightened days no mother is left lying flat on her back for a fortnight unless she is suffering from some complication which merits such treatment. Most are doing simple exercises by the third day. The cause of mothers rushing to find "supports" is often the feeling of pelvic discomfort described coupled with sagging abdominal muscles and a desire to return to a pre-pregnancy figure. Added to this she finds much encouragement from those around her to get a good corset. Much trouble could be avoided if mothers were plainly told that the feeling will pass off (provided examination shows all is normal). They should carry on with simple exercises, light work, and simple corsets. Rest periods are necessary, and feeding sessions help to provide these. Lifting heavier children until strength is regained should be avoided. Massage with supervision of exercises is helpful if it can be arranged.

I think Dr. Neal Smith is rather unfair to the "well-to-do" mother. She knows she can rest only while she is away from home with the present shortage of domestic staff. She is in a worse position than her poorer sister, who has a smaller house and does not bother so much about appearances, and who does not have to face the difficulties of a professional man's wife, for instance. The poorer mother leading a more communal type of life can more readily call in relatives or neighbours to help, while in larger families the older children look after the younger.

In many cases there is no need for skilled attention after about the tenth day, but mothers should be allowed time to resume their full activity gradually and to be encouraged to continue breast-feeding. There is an urgent need for a really efficient domestic service with priority for mothers, or for special "convalescent" homes. The former scheme which has been envisaged is likely to prove more acceptable, in my opinion.—I am, etc.,

Winchester. MYRTLE M. HUTCHINS.

Advice on Sterility

SIR,—Whilst appreciating Dr. R. H. P. Hick's annoyance about the growth of clinic services (June 5, p. 707) I believe that in this instance the complaint is without foundation.

The contraception clinics at present run by the Family Planning Association can in no way cut across the work of the family practitioner. No patient is seen whose family income exceeds £5 weekly, and before the war very many were wives of unemployed men for whom even the appliances had to be gratuitously provided. Such patients frequently have no doctor of their own, and in these times of "call-up" and evacuation the links are still further severed. It will be among the friends and relatives of such working-class patients that the work on involuntary sterility will in all probability extend.

It is relevant to add that in many cases the family practitioner does not appear to be the most helpful person to approach in such matters. Considerable postgraduate experience is required for the competent fitting of contraceptive appliances, and, with the rapid advancement in the study of sterility, the scope of purely consulting-room advice is inevitably diminishing. There are many women who badly want a pregnancy but who cannot bring themselves to ask their family doctor for advice which they feel to be of such an intimate nature. This is wholly irrational, but undoubtedly true. Although, fortunately, there are practitioners whose skill and interest in such work are second to none, I think Dr. Hick could hardly fail to agree that the majority of heavily worked practitioners are *not* anxious to be consulted regarding problems of a sexual nature. It is a very common experience at clinics to find that patients who have been in the greatest need of intimate advice have received either evasive replies or totally inadequate help from their own doctors. It can hardly be doubted that the family practitioner who is unembarrassed by such inquiries, and willing and competent to deal with them, will *always* be the first to receive his patients' confidence; and, for the rest, the growth of the specializing clinic will be invaluable.—I am, etc.,

London. JOAN MALLESON.

Adder Bite

SIR,—Last year the treatment of adder bite received some prominence in your columns. Clearly the use of specific antivenom is the ideal treatment, and it is impossible to draw conclusions from a single instance, but the following case seems sufficiently dramatic to justify a further trial if the proper antidote is not immediately available.

A nursing sister aged about 25 was bitten on the instep by an adder at 5 o'clock one afternoon. She was put to bed as soon as possible and hot fomentations were applied at the site of puncture. I saw her at 11 the next morning. By this time the leg was grossly swollen from ankle to knee, with considerable bluish discoloration. The patient stated that the swelling was rapidly spreading and that the leg was throbbing painfully. I advised the application of kaolin poultices and injected 5 c.cm. of heparin intravenously. Within a few hours of the injection the pain had vanished and the swelling had begun to subside. After forty-eight hours the leg was back to normal and the patient allowed up. For two or three weeks the leg was swollen by the end of the day, but apart from that she had no further trouble.

The only other case of adder bite of which I have personal knowledge had acute symptoms for a much longer period and took longer to clear up. This seems to have been the experience of other practitioners with whom I have discussed the matter.

While occupying your valuable space, may I strongly endorse Dr. Bensted-Smith's letter entitled "Houses to Live In," published in the *Journal* of May 8. As a West Country rural practitioner I agree with every word he says.—I am, etc.,

T. M. DAVIE, F/O,
B.M., B.Ch.

Phage for Dysentery

SIR,—In the *Journal* of Dec. 5 (p. 673) is an account of a paper by Col. Fairley on the treatment of bacillary dysentery, and in another recent issue there was a communication from Sir Philip Manson-Bahr on the same subject. Neither of these very experienced physicians even mentioned bacteriophage, and this to me was a very surprising omission.

I will not burden you with statistics, but after 23 years' practice in Alexandria I regard a good bacteriophage as being usually as specific in the case of adults suffering from bacillary dysentery as is antitoxin in diphtheria. I refer to the type of dysentery met with in Alexandria and its neighbourhood, as it is only in this area that I have used bacteriophage. I have no reason to think that the treatment would be less effective with bacillary dysentery elsewhere in the Near and Middle East or even in any part of the world. There is no doubt that for some reason unknown to me bacteriophage often fails in the case of infants and very young children.

As in most illnesses, from a perforated gastric ulcer to a common cold, it is essential to begin treatment without delay. After the lapse of some days, as pointed out by Dr. Compton, one is not dealing with an uncomplicated dysentery but with ulcers grossly contaminated by a very heavy secondary infection with which bacteriophage cannot deal. In my practice I usually get the cases within a few hours of the onset, and it is no exaggeration to say that bacteriophage cures the great majority within 24 hours, often within 6 to 12 hours. Before I began to use bacteriophage I usually paid some 10 visits to each dysentery patient. Now, as a rule, not more than 2 visits are necessary—a considerable annual financial loss to me! I have generally used the bacte-intesti-phage made by the Laboratoire de Bactériophage in Paris under the control of d'Hérelle. But other efficient phages are now available. One ampoule is given every 3 hours, and nothing else allowed by mouth except water. After 1 to 3 doses all pain and diarrhoea have usually ceased and the stools are faeculent and becoming firm. Occasionally 6 to 10 doses are needed. This is the usual story; but it must be acknowledged that even with adults there are a few complete failures where bacteriophage is entirely without effect. I do not think there are more than 5% of such failures. I had one such recently which responded dramatically to sulphaguanidine.

The R.A.M.C. appears to have abandoned the use of bacteriophage. I understand that it was tried on infants and young children in a families' hospital and on patients in a base hospital. I have mentioned above that with infants and small children the results are frequently disappointing; in the base hospital the patients presumably did not start the treatment until a considerable time after the onset of the disease. These facts would account for an unfavourable report on the treatment.

I am entirely in agreement with Dr. Compton that if each regimental M.O. had a supply of good bacteriophage and administered it immediately at the first symptoms of dysentery or enteritis it would very seldom be necessary to evacuate the patient to the base or even to a field hospital.—I am, etc.,

Alexandria. E. N. RUSSELL.

Slow Union of Fractures

SIR,—In a leading article on the slow union of fractures (May 29, p. 669) you state that "there is little evidence that the biological conditions are any different from those of thirty years ago." Yet Sir Robert Jones made the same complaint in 1916 and I answered from the medical and dietetic point of view, and the letter was published in the *Journal*. I pointed out that the same complaint was alleged by the surgeon-in-charge of the Northern Army in the American Civil War—Stimson—so this complaint is as old as the hills.

Biochemists have satisfied themselves that the fault is not in the cells or blood, for the quotient of calcium, iron, and phosphorus is, according to them, normal. Yet I pointed out then that clinically I have commonly seen excessive callus retract and become compact bone after a few weeks' treatment with syrup. ferri phos. co.—Parrish's food—and so take it off structures upon which it was pressing. I have also seen ununited fractures with weak callus become as strong as the proverbial iron when the patient is given this remedy. Furthermore, bruised bone will heal after many months of pain if the same medicine is given.

The only conclusion I can come to is that it is a nervous influence resulting from shock in the less well conditioned subjects, the nerve centres in the spinal cord corresponding to the seat of injury being depressed, and it is the giving of this old remedy that restores the nervous tone. I cannot think of any biological action, such as enzyme formation stimulating the osteoplasts, being the wanting factor, but the fact remains that in general practice I have had success by this method. For example, I had a case of extracapsular fracture of the femur with weak callus which had failed to respond for nine months in

hospital, but in which hard callus formed in five weeks; again, a case of fracture of the patella, without capsule, in a woman aged 60, which united in five weeks with free movement. These and many other similar cases of lesser degrees of injury have made such an impression on my mind that I think such a simple remedy might well be given a trial again.—I am, etc.,

London, S.E.1. R. LARKIN.

Mass Radiography and Incidence of Pulmonary Tuberculosis

SIR,—The cogent and timely observation of a practical radiologist of the standing of Dr. J. F. Brailsford on "the grossness of lesion necessary . . . to give radiographic evidence of departure from the normal" (May 22, p. 646) will be warmly welcomed by experienced clinicians who have made an unbiased study of tuberculosis diagnosis in this country during the last thirty years. Equally true is his inference that any radiographic scheme which does not include early cases without radiographic lesion fails to help the tuberculosis service.

To radiograph the whole population and report on 500 films a week, Dr. Brailsford calculates the need for 1,000 units with full staff and 6,000 medical officers. For weekly transport 330,000 buses will be required on an estimate of Dr. N. P. Henderson. This radiologist (Jan. 16, p. 81) wrote that it would take 80 years to examine Greater London at a speed of 100,000 cases a year with one of the present static machines. Dr. Brailsford's demonstration of the immensity of the problem of administration is well appreciated by those of us who are medical members of local authorities. Lay members may be carried away by their own enthusiasm and by the propaganda and the promised Ministry of Health grant, estimated at about £250,000 for 250 machines, and, in select cases, with dependants' allowance. Therein lies the danger of aiding "wishful thinking" by propagating the idea in the minds of the people that at long last tuberculosis will be eradicated.

Fl. Lieut. Evans, in his survey of mass radiography of 75,000 Air Force personnel (May 8, p. 565), detects an incidence of 234 active cases of tuberculosis—i.e., 0.3%—and 387—i.e., 0.5%—inactive cases. In a communication on "Tuberculosis in Recruits" (*Journal*, Aug. 16, 1941) I estimated that of 2,500 examined by me in a year 2% may be considered tuberculous by the average dispensary *x*-ray diagnosis. It is evident, therefore, that the finding of 0.3% active, or 0.8% if the inactive are included, among those passed fit by the medical boards is no criterion of the efficacy of mass radiography, but may be due to the lack of expert clinical machinery at examining medical boards. Evans had the further advantage of continued clinical investigation under compulsory conditions.

Regarding his inactive 0.5% calcified or fibrosed cases, these will be a greater problem for the clinicians to classify and control, especially when it will be remembered that among Australian recruits Cooper found by mass radiography 23% inactive tubercle as against 2.07% by Galbraith. It is difficult to reconcile Evans's figure of 0.8% incidence among fit personnel with the figure of only 112 out of 1,869 recruits—i.e., 6%—referred to the Welsh Memorial Board by the medical boards in Wales (June 21, 1941). In a Yorkshire centre covering a period of three years this percentage was even less, being 4.9%—i.e., 31 out of 457 referred recruits. Full-size *x*-ray films will presumably have been used.

One regrets that the only figure mentioned in the M.R.C. report on "Tuberculosis in Wartime" in the mass radiography section was the 1% tuberculous persons found at a Mitcham radio works, and no attempt was made to marshal all published figures.

I have previously called attention to the fact that although radiography has been increasingly used the diagnosis of tuberculosis has lowered from 51.2% in 1926 to 35.6% in 1938. One reads from the M.R.C. report that 65% of those discharged in the latter year were admitted to tuberculosis institutions as intermediate or advanced cases in England and Wales. The experience of doctors, who are referring increasing numbers of symptomatic cases to tuberculosis clinics, is that a large percentage are either considered negative or inactive since *x*-ray examination has become a routine measure with a decrease in early cases of the type Dr. Brailsford has noted.

His last point—that we have more cases than either accommodation or staff—is equally unchallengeable. Surely if the Ministry of Health by intensive propaganda secures an added 1% or 2% by mass radiography at a comparatively high cost there must be a parallel policy of encouraging local authorities to increase their accommodation and attract staff who will not forsake clinical experience for administrative salaries; otherwise it would seem a case of putting the cart before the horse.

There is much criticism of the efficiency of the doctor in a machine age. With a tendency for the profession to rely more on auxiliary diagnostic methods, clinical instinct and acumen acquired by experience and inspired by the old teaching methods are, unhappily, fast disappearing.—I am, etc.,

Leeds. Z. P. FERNANDEZ.

Treatment of Malaria

SIR,—Quinine, mepacrine, and pamaquin can be combined in numberless ways in the treatment of subtertian infection, but of all methods treatment with quinine alone is probably the least satisfactory. In the *Journal* of April 17 (p. 476) I described a standardized treatment used in my wards at the Seamen's Hospital. The only objection to this scheme is the prodigal use of quinine.

Recently I have treated 11 cases of subtertian infection by two daily intramuscular injections of quinine for 4 days, followed by mepacrine 0.1 g. t.d.s. for 7 days, and, after a short interval, by pamaquin 0.01 g. t.d.s. for 3 days. This course appears to be satisfactory and produces defervescence of fever within a maximum of 72 hours. The amount of quinine used is minimal. The preparation of quinine used is solvochin, which has the great advantage of being almost painless. While the shortage of quinine lasts it is essential that the drug should be given in the most effective and economical way and that synthetic products should be used wherever possible.—I am, etc.,

London, W.1. ALEC WINGFIELD.

Dose of Atebrin in Malaria

SIR,—In all recent articles and discussions on the treatment of malaria with atebrin the dosage has always been given as 0.1 g. three times a day. After using atebrin in many cases it became apparent to me that it had one big disadvantage compared with quinine, and that was that it did not control the pyrexia so quickly.

As, when injection treatment was necessary, one gave 0.3 g. I decided to try larger initial doses by the mouth. I tried it on myself at first and later on others, and have since treated many hundreds of cases with the dosage as follows: first dose, 0.3 g. to be given if possible in the interval between paroxysms—I instruct the patient to take this dose as soon as the sweating stage of a paroxysm is finished; second dose, 0.3 g. given six hours after the first; second and third days, 0.2 g. morning and evening; fourth to sixth day (inclusive), 0.1 g. three times a day. With this dosage the pyrexia is rapidly brought under control, and I have never seen any toxic effects result from it. The total dosage is higher than that originally advocated, as there is evidence that relapses are less common with the higher dosage.

Dr. J. Bryant quite independently came to the same conclusions, and used a similar high dosage, and he reported on this method in an article which was published in the *East Africa Medical Journal*; but it seems to me advantageous that this method should be given wider publicity.—I am, etc.,

R. W. STEPHENSON,
Senior Medical Inspector, Sudan Medical Service.

Vaccination in India

SIR,—I have just seen Dr. C. Killick Millard's letter (Dec. 5, 1942, p. 678). While sympathizing with him on being dubbed an "antivaccinationist," I feel it should be pointed out how dangerous are his statements in his last paragraph, especially in connexion with "universal vaccination" in India. India is "still attempting to do so," but one has only to see the teeming millions of this country to realize the immensity of the problem. Moreover, the position is severely complicated by the rapid deterioration of vaccine lymph under the conditions of heat prevailing in this country. Recently, during the course of a severe epidemic here, I have personally had a dozen cases in a batch of men who were "vaccinated" (under Service conditions) two months previously. Obviously the lymph was

useless. On the other hand, a group of Europeans who have lived here for years, and have been vaccinated many times without effect, have recently "taken" with a supply of fresh lymph only a day or so old. Obviously such factors must be taken into account when making statements about the failure of universal vaccination.—I am, etc.,

Jeypore, Upper Assam. JOHN A. LEWIS.

Sir Arthur Newsholme and Russian Medicine

SIR,—In your obituary of Sir Arthur Newsholme (May 29) reference is made to *Red Medicine*, written in collaboration with the late J. A. Kingsbury after a visit to the Soviet Union in 1933. It is stated: "His own impressions of Russia at that time were very mixed. He saw it with some misgiving 'going bald-headed' into a completely socialized medicine, a policy and action towards which nearly every Western country was advancing but by slow degrees."

This summary does scant justice to Newsholme, who provided many of us with our first introduction to the achievements and potentialities of Soviet medicine. Actual quotations give a clearer idea of the general viewpoint expressed in this book. In the preface (p. vii) the authors write: "Soviet Russia has decided that the health of the individual is the concern of society as a whole. Indeed, the Soviet Union is the one nation in the world which has undertaken to set up and operate a complete organization designed to provide preventive and curative medical care for every man, woman, and child within its borders." In the introduction (p. 4) they state that they were forced to the conclusion that "a marvellous reformed and extended medical service had been organized in Russia, the methods and procedures of which the rest of the world would do well to study." And in their concluding observations on the socialization of medicine (p. 309) Newsholme and Kingsbury state that in the U.S.S.R. this "has removed the doctor almost entirely from the field of monetary competition, and has thus abolished a chief source of inadequate medical service. It has made a gratuitous (that is, State-paid) medical service of an astonishingly complete character promptly available for the vast majority of urban populations, a service which is being rapidly extended to rural Russia; and it has given the whole of this service an admirable turn in the direction of social as well as medical preventive measures."—I am, etc.,

P. D'ARCY HART.

Feeding the World's Population

SIR,—It is deplorable that the delegates to the United Nations conference on food and the influential persons who have contributed articles or speeches regarding its aims seem ignorant of the Malthusian difficulty. The world's inhabitants still have a birth rate of 30 or more per 1,000 a year, due mainly to those in Asia, Russia, the Balkan States, and Africa. To have enough for all, they would therefore need to increase their food supply at a rate of at least 20 per 1,000 a year. Can they possibly increase their food supply twice as fast as hitherto? If they could, and did, they would double their numbers about every thirty-five years. However, Sir John Orr has gone far beyond the foregoing Malthusian view by stating that the "world supply of food would have to be increased by about 150 or 200% to maintain the world population in health"—meaning, presumably, even merely its present 2,000 or so millions.—I am, etc.,

Binfield, Berks. B. DUNLOP.

Arsenical Encephalopathy

SIR,—The two articles on arsenical encephalopathy (May 29, pp. 661 and 663) were especially interesting to me in that of the five cases reported four were treated by twice-weekly injections of arsenic and bismuth. This method, of which I was the sole advocate in this country for several years, has now become widely used because of the unfailing serological cure which is effected in primary and secondary syphilis. Cases 1 and 2 in the first article were actually treated for syphilis by me. Case 1 was regarded as of sero-positive primary syphilis, since a penile ulcer was present, but no *Spirochaeta pallida* were found on three examinations by the dark-ground method. The blood Wassermann, originally reported as doubtful, became positive later, and treatment was instituted for sero-positive primary syphilis, despite the inference in the article that this was a case of late latent syphilis.

Another interesting point was the insistence by the authors on the symmetry of the lesions found in the brain. This could be explained if one leans to a belief that syphilis plays some part in the pathology. The lesions of secondary syphilis are characteristically symmetrical, and as most of the victims of this catastrophe are in the 18–22 age group the probability is that the disease is in its early secondary stage. It is an interesting parallel that Milian's erythema and the manifestation of arsenical encephalopathy both occur about the ninth day of treatment.

The apparent increased incidence of this complication would be alarming were it not realized that in the series of cases quoted the hospital authorities concerned were aware that the patient was undergoing arsenical treatment. This is a coincidence that must in the ordinary course of events be unusual, since most patients prefer to keep the knowledge of their infection to themselves. There must have been many cases of coma resulting in rapid death where, in the absence of any history, the possibility of arsenical encephalopathy has never been considered. Unfortunately there is usually no search for signs of acupuncture in the antecubital area in the receiving room.

Those who have been interested in the relative toxicities of mapharside and neo-arsphenamine will not fail to note that in the Liverpool series, quoted by Dr. Glyn-Hughes and his collaborators, three out of the four cases were treated by neo-arsphenamine. For two and a half years in all the Liverpool clinics mapharside has been substituted for neo-arsphenamine in the twice-weekly injection routine for early syphilis, and there has been no evidence to suggest that it is more encephalotoxic than neo-arsphenamine.—I am, etc.,

Liverpool. A. O. F. ROSS.

Obituary

ARCHIBALD SIMPSON, M.B., F.R.C.S.ED.

Mr. Archibald Simpson, one of the best-known practitioners in Shropshire, died suddenly on June 5 at the age of 60. He had practised in Shrewsbury for 32 years and held the following appointments: honorary surgeon, Royal Salop Infirmary; consulting general surgeon, Robert Jones and Agnes Hunt Orthopaedic Hospital; officer-in-charge, Ante-natal Clinic, Shrewsbury; medical officer, Shropshire Technical College of Domestic Science. A native of Edinburgh, Mr. Simpson graduated M.B., B.Ch. in 1905; five years later he acquired the F.R.C.S.Ed. He held house appointments at the Royal Maternity Hospital, Edinburgh, the Darlington Hospital, and the Royal Hospital for Sick Children and Women at Bristol. In the last war he served over-seas in the R.A.M.C., holding the rank of captain.

In the passing of Mr. Simpson (writes a colleague) Shropshire loses an outstanding personality. In spite of the natural reserve of the Scot his essential kindliness in practical directions could not be concealed. Most thorough in his attention to patients, he proved himself a real friend and counsellor in serious trouble. His patients showed great attachment to him and confidence in his professional skill and stimulating personality. A man of fine physique, he took an active interest in sport during his brief leisure hours. He was generally admired as an excellent shot; he also distinguished himself as a horticulturist. He is survived by his wife and by his only child, an officer in the Royal Artillery now unfortunately a prisoner of war in Singapore.

A. G. MCKENDRICK, D.SC.ABERD., M.B.GLASG., F.R.C.P.ED.

Lieut.-Col. Anderson Gray McKendrick, late superintendent of the Laboratories of the Royal College of Physicians of Edinburgh and a former director of the Pasteur Institute of India, Kasauli, died on May 30 in Inverness-shire. He studied medicine at the University of Glasgow, graduating M.B., Ch.B. in 1900; he was elected F.R.C.P.Ed. in 1924, and received the degree of D.Sc. from Aberdeen University in 1927. He was a Fellow of the Royal Society of Edinburgh, and the Royal

College of Physicians awarded him the Cullen Prize in 1934. At the Annual Meeting of the B.M.A. in Edinburgh in 1928 he was vice-president of the Section of Tropical Diseases.

The sudden death of Anderson McKendrick (writes W. F. H.) creates a sorrowful blank for his many friends. He was well beloved, and truly one who could bring sage counsel to anyone in difficulty. That was a role which, I feel, he performed for many men. It explains the success of his administration of the Edinburgh Laboratory, of which he was the superintendent for twenty years. He had obtained first place in the Indian Medical Service examination. After a short term of military duty, which included active service on the Somaliland Expedition, he became committed to a scientific career as one of the original members of the Research Department of the Government of India. Most of his work in India was connected with the treatment and investigation of rabies. That led in later years to his appointment to be the League of Nations' statistician for this disease. McKendrick's life is one of those shining examples of a man partially broken down in health continuing to do fine work of a high order. He became director of the Royal College of Physicians' Research Laboratory in Edinburgh and occupied that post for twenty years, a longer period than any of his predecessors: German Sims Woodhead, Noël Paton, and James Ritchie. His research work was of pioneer type—the mathematical, statistical investigation of epidemics, if one can really restrict it to a single subject. But it is even more to McKendrick in his daily life that one gives admiration than to his outstanding ability. His was an upright, broadly religious life, openly avowed. He was a man to be trusted and a guide to both older and younger men. His administration of his laboratory, which should have continued for the duration of the war, had to be discontinued for health reasons, and his few happy active retirement years have not been long enough to see the end of the present world struggle.

OLAF SCHEEL, M.D.OSLO

News has reached London of the recent death, in Oslo, of Dr. Olaf Scheel. Until his retirement in 1940 Scheel was chief physician to the IXth (Medical) Department of the Ullevaal Municipal Hospital, Oslo, which became so well known through the researches on tuberculosis in nurses published from 1928 onwards by Heimbeck, at that time first assistant physician to Scheel's department.

Dr. A. L. JACOBS writes:

Scheel's name is not well known in this country, but it was in his department and under his inspiration that these researches were initiated. Although he generously remained in the background, he made a contribution of first importance to this work, which has had such effect in modifying our views of tuberculosis in young adults. The Oslo workers' discovery of the frequency of primary infection in adult life, and of its close association with the more destructive and fatal forms of the disease, at once stimulated workers in other countries to carry out similar investigations, most of which have amply confirmed the Oslo findings. The practical and factual approach of the Norwegian workers acted like a cold breath of fresh air in the torrid atmosphere of theorizing and speculation which has so clouded our understanding of the pathogenesis of tuberculosis. Anyone who knew Scheel well would at once recognize his part in this salutary influence, for he was a man to whom an ounce of fact was worth a ton of theory.

In Scandinavia Scheel was well known for his emphasis on the importance of environmental conditions, and especially the standard of life, upon tuberculosis mortality. He was also one of the first to initiate the investigations upon university students which have been so widely taken up, and he and Heimbeck introduced B.C.G. vaccination by the intradermal method among students and nurses found to be tuberculin-negative. The results of these researches, notable for their careful statistical control, form a weighty body of evidence of the protective value of the vaccine in young adults, and have led to the use of the B.C.G. vaccine by many other workers in Scandinavia, the U.S.A., and the U.S.S.R. The Prophit Tuberculosis Survey, at present being carried cut by the Royal College of Physicians, is modelled on the earlier Oslo investigations.

Scheel had little contact with British medicine, and published only one brief paper in a British journal (*Lancet*, 1937, **1**, 922). He was, however, a fine French scholar, very well known among French chest physicians, and published much work in the French journals. At the International Tuberculosis Conference at Lisbon in 1937 he opened a discussion on primary tuberculous infection in adolescence. The last years of his life must have been sadly clouded by the invasion of his country and of France, which cut him off from most of his foreign friends and brought him much personal sorrow. To one who worked in his department and experienced his generous help and inexhaustible hospitality the news of his death brings a sharp sense of loss. There can be little doubt that his name will become better known among tuberculosis physicians in this country when the impact of his work upon tuberculosis theory is fully felt.

Universities and Colleges

UNIVERSITY OF OXFORD

Sir Farquhar Buzzard, Bt., D.M., lately Regius Professor of Medicine and Student of Christ Church, has been elected to an Honorary Studentship at that college.

UNIVERSITY OF GLASGOW

The King, on the recommendation of the Secretary of State for Scotland, has approved the appointment of Prof. James Hendry, M.B., F.R.F.P.S., F.R.C.O.G., of the Muirhead Chair of Obstetrics and Gynaecology, to be Regius Professor of Midwifery to fill the vacancy caused by the forthcoming retirement of Prof. S. J. Cameron.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Centenary of the Fellowship

In celebration of the Centenary of the Fellowship the President and Council of the Royal College of Surgeons will hold a reception from 8 to 10 p.m. on the evening of Wednesday, July 21, in the Great Hall of Lincoln's Inn (by kind permission of the Treasurer and Masters of the Bench of the Honourable Society of Lincoln's Inn). Some of the newly elected Honorary Fellows will be admitted on the occasion. Owing to the paper restrictions invitations will not be issued to the Fellows of the College, *but those desiring to attend should apply for tickets to the Secretary of the College*. Applications will be dealt with in order as they are received. Day dress or uniform —academical costume if convenient.

At 3 p.m. on July 21 there will be a general meeting of Fellows of the Royal College of Surgeons of England, when various important questions will be under discussion. The agenda of the meeting will be issued at a later date.

At a meeting of the Council held on June 10, with Sir Alfred Webb-Johnson, President, in the chair, Prof. G. Grey Turner was reappointed representative of the College on the Council of King's College, Newcastle-upon-Tyne. The President announced the appointment of Air Commodore P. C. Livingston as Moynihan Lecturer for 1943. It was decided to recognize for the duration of the war the posts of resident surgical officer and house-surgeon at the Connaught Hospital, Walthamstow, for the six-months surgical practice required of candidates for the Final Fellowship Examination.

Diplomas of Fellowship were granted to the following candidates:

A. F. Clift, H. S. Joseph, T. P. N. Jenkins, A. Cavendish, S. Mottershead, K. H. S. Dalliwall, E. R. Davies, C. Brun, R. B. Zachary, R. H. Percival, D. Ranger, H. L. McMullen, E. L. Farquharson, I. A. Page.

Diplomas of Membership were granted to I. M. MacArthur and R. J. T. Woodland.

Diplomas in Anaesthetics were granted, jointly with the Royal College of Physicians of London, to the following candidates:

A. Beck, Una M. Campbell, Maeve Cronin, H. W. L. Dale, D. E. Dunnill, J. C. Easson, G. E. H. Enderby, C. W. Fleischmann, A. J. Fraser-Simson, Evelyn W. Glennie, D. C. Howard, P. T. Merlin, S. E. Osborne, Christine M. Rendell, Helen M. Rossiter, B. A. Sellick, G. H. T. Stovin, H. Q. O. Wheeler.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At a meeting of the College, held on June 4, the following were admitted *as Fellows:* Reginald Hall, M.D., T. M. Kavanagh, M.D., Brendan O'Brien, M.B.; *as Members:* Maude F. P. Bigger, M.B., A. H. Isaacson, M.B., F. F. McKee, L.R.C.P.&S.I., G. S. Prince, M.B.

The Services

The Efficiency Decoration of the Territorial Army has been conferred upon Col. W. R. Ward, late R.A.M.C.(T.A.); Lieut.-Col. (acting Brig.) G. J. V. Crosby; Lieut.-Cols. (temp. Cols.) J. H. Donnelly, D. Mackie, M.C., R. Rutherford; Majors (temp. Lieut.-Cols.) R. O. Brooks, M. S. Good, G. L. Montgomery, E. A. L. Murphy, R. S. Taylor, J. M. F. Whitby; Majors P. Hayes, F. J. L. Lang, R. Pollok, R. V. Powell, all R.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

Wounded.—Capt. A. R. P. Ellis, R.A.M.C., Capt. M. W. Harvey, R.A.M.C., War Subs. Capt. C. W. Warner, R.A.M.C.

Died of Wounds.—War Subs. Capt. A. Mackler, R.A.M.C.

Medical Notes in Parliament

"In the Discard"

Dr. SUMMERSKILL on June 10 asked the Minister of Health on what facts he based his opinion that the implementation of Assumption B by the introduction of a salaried medical service was now in the discard. She further asked how Mr. Brown proposed to obtain the views of the doctors in the Services and those not members of any organization on the future of medical practice, and how he proposed to obtain the views of the people on a State Medical Service and on the extension of the present system of medical practice, respectively, before he issued a White Paper. Mr. BROWN said he had repeatedly tried to make it clear that the recently resumed discussions with the Representative Committee of medical men and women were to be regarded as only a preliminary and non-committal exchange of ideas; that he hoped as the next step to publish the Government's appreciation of the main issues involved; and that this publication would afford everyone—including those in the Forces—a full opportunity for open and public discussion before final decisions were taken.

Dr. SUMMERSKILL asked why the British Medical Association quoted the Minister as saying that the salaried medical service was in discard. Mr. BROWN replied that he was not responsible for what the B.M.A. said. The needs of the people were the primary issue, and there were many other bodies beside doctors to be consulted. More than one Government statement had made clear that what was sought was not a State service but a comprehensive medical service, based on co-operation between the medical profession, the State, and the local authorities. Sir HENRY MORRIS-JONES asked whether Mr. Brown knew that the medical profession repudiated the idea of becoming full-time civil servants. Mr. Brown did not reply.

Compulsory Notification of Venereal Disease

On May 20 Dr. SUMMERSKILL asked whether the Minister of Health, in view of the fact that only 1 man and 27 women had been treated under Regulation 33B, would consider the introduction of compulsory notification in order effectively to reduce the incidence of venereal disease. Mr. BROWN said he would not take this course. The numbers mentioned by Dr. Summerskill related to persons so far reported from more than one quarter as alleged sources of infection. The figures were not in themselves a true criterion of the efficacy of the Regulation, which, it was already evident, was indirectly doing much to help in getting infected persons to undertake voluntary treatment.

Alien Doctors after the War

Mr. ERNEST BROWN told Mr. Hannah on May 20 that he could not make any statement as to the policy of the Government for the future of alien doctors allowed to practise under restrictions in this country "for the duration" and anxious, if possible, to continue to serve here or in the Colonies. The arrangements under which certain doctors were temporarily registered under the Medical Acts by virtue of foreign qualifications would cease with the lapse of the Emergency Powers under which they were made.

Nutrition and Child Mortality in Belgium

Answering a question on May 26, Mr. DINGLE FOOT said that the food shortage in Belgium was felt severely by the child population, but his information did not confirm that, taking the country as a whole, these conditions caused any striking increase in child as distinct from infant mortality. According to statistics recently published in Belgium, there was last year a fall in the death rate of infants under 1 year. The figures for deaths per 1,000 live births were, in 1939, 73; in 1940, 89; in 1941, 85; and in 1942, 78. Medical supplies in the strict sense of the term were and always had been allowed to pass through the blockade.

The Assistant Nurse in Scotland

Mr. T. JOHNSTON, on May 27, moved the second reading of the Nurses (Scotland) Bill. He explained that it varied from the Bill recently passed for England in proposing that assistant nurses should not be recognized in perpetuity, but for five years. This Bill provided that after five years from the commencement of the Act no course of training begun under rules made in the section dealing with assistant nurses should qualify any person for admission to the roll. Another divergency from the English Bill was in Clause 14, which gave power to the General Nursing Council to give a remission, for appropriate cases, in the period of training of nurses who were studying, or proposed to study, for the full certificate under the 1919 Act. If a girl had gone through a year's or two years' preliminary training she should have some remission in the period of training if she intended to sit for her examination again. The Government was not interfering with the standards of examination. Under the principal Act these regulations of the General Nursing Council in Scotland would have to be discussed with the General Nursing Council in England. Every attempt was being made to secure reciprocity. He was not wedded to the precise words of Clause 14. Mr. Johnston went on to say that Scotland had adequate beds and first-class hospitals, but was short of nurses. For tuberculosis they could make arrangements in some emergency hospitals if they had an adequate supply of nurses. They were discussing with certain voluntary hospitals how to affiliate for training purposes some of the splendid emergency hospitals and to rotate through two or more of these hospitals student nurses in course of training. Mr. MATHERS welcomed the Bill, but said the College of Nursing had definite grounds for apprehension about Clause 14.

Mr. WESTWOOD, replying for the Government, said there was no intention to reduce the status, training, or qualifications of the nursing profession. Nursing personnel would be required for the extended medical, hospital, and public health services which the Government was now planning. The Scottish Office proposed to draw the attention of education committees to the increased shortage of nurses, and to ask them afresh to interest girls at secondary schools in pre-nursing courses. If this Bill became an Act the Department would urge local authorities to provide pre-nursing courses and continuation classes, and also to ask for further pre-nursing courses at central institutions. Negotiations were being carried through with the hospital authorities for providing facilities to give the proper training to those who were recommended. The Department had had negotiations with the voluntary hospitals.

The Bill was read a second time.

War Casualties

Mr. ATTLEE on June 1 stated, in reply to Mr. Molson, that the casualties suffered by all ranks of the British Empire Forces during the first three years of war, excluding deaths from natural causes, totalled 514,993. Of these, 92,089 were killed, 226,719 missing, 88,294 wounded, and 107,891 prisoners of war.

Skin Diseases in the Army

Sir JAMES GRIGG, replying to Mr. Bellenger on June 1, said he was aware that war conditions tended to increase the incidence of all skin diseases, including dermatitis and impetigo. The steps taken to reduce these diseases included the provision of facilities for ablution and the washing of clothes, the circulation of up-to-date information to all medical officers, medical inspections, and improved facilities for treatment. This included, when necessary, treatment by specialists.

Mr. BELLENGER suggested that officers, generally speaking, did not suffer from these complaints, and asked if that was not sufficient indication that there was something from which the men specially suffered—for instance, dirty blankets—which required the attention of the medical authorities in the Army. Sir JAMES GRIGG said he thought that was extremely unlikely. He denied that there was something special and unsuitable in the conditions of other ranks which made them particularly liable to these diseases in the Army.

Mr. RHYS DAVIES contended that dermatitis was increasing among these men when they were in civilian employment before they were passed into the Services. Was it not possible to ask the medical boards to look for these diseases? Sir JAMES GRIGG said he would look into that point. His information was that dermatitis was becoming increasingly prevalent in civilian life.

Non-pulmonary Tuberculosis under Government's Scheme

On June 1 Mr. MCNEIL asked the Secretary of State for Scotland why, in his recently announced scheme of relief for tuberculous patients and their dependants, he had excluded all patients other than those suffering from pulmonary tuberculosis. Mr. WESTWOOD replied that the purpose of the allowances scheme was to encourage people suffering from pulmonary tuberculosis to seek early treatment, not only in their own interest but, since the disease was infectious, in the interests of their families and the general community. The scheme did not extend to persons suffering from non-pulmonary tuberculosis, because the disease in this form was not infectious and did not constitute such a danger to the general public health. Mr. MCNEIL asked if the danger to other people and not the necessity to treat the sufferer was the main reason for this scheme. Mr. WESTWOOD replied that the main reason was the report of a committee set up by the Medical Research Council, at the instigation of the Government, which recommended these allowances for pulmonary tuberculosis cases and made no recommendation so far as non-pulmonary cases were concerned.

University Grants Committee's Funds.—Mr. MANDER asked the Minister of Health on May 18 whether it was proposed to add to the membership and funds of the University Grants Committee in view of the plans for increased teaching in voluntary hospitals. Mr. ERNEST BROWN replied that it was too early to express any view upon this, pending the report of the Committee on Medical Schools now sitting under the chairmanship of Sir William Goodenough.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week measles notifications fell by 982, whooping-cough by 213, and dysentery by 30, but those for scarlet fever, diphtheria, and acute pneumonia rose by 257, 93, and 88 respectively.

In Staffordshire the notifications of diphtheria and whooping-cough went up by 21 and 32 respectively—the only increases of note in these diseases for the whole country.

Scarlet fever rose sharply in Yorks West Riding 75, Lancashire 46, and Staffordshire 43. Whooping-cough declined, principally in Lancashire by 74, Warwickshire by 63, and Yorks West Riding by 53.

The lower incidence of measles was almost general throughout the country, and particularly in Glamorganshire by 224 cases, Staffordshire by 130, Essex by 118, and Northamptonshire by 101. Norfolk, with an increase of 131, was the outstanding exception to the general trend.

Dysentery was less prevalent in most areas, but in Denbighshire, Wrexham M.B., there were 11 cases. The other chief centres of infection were Lancashire, 27 cases, and London, 13.

In *Scotland* there were 18 more cases of diphtheria, but decreases were reported for whooping-cough 60, measles 52, and dysentery 23.

Diphtheria

The Chief Medical Officer of the Ministry of Health stated at a recent Press conference that 3¾ million children had been immunized under the free scheme organized by local authorities, and many had been dealt with by private practitioners. The total proportion immunized was at least 50% of the child population aged 0–15. In an attempt to raise the proportion to at least 75% another campaign is to be launched, which will receive the support of all general practitioners. The death rate from diphtheria at ages under 15 in 1942 was 192 per million population, and was 14% lower than the lowest previous value. The rates for 1939-41 were 228, 266, and 280. Compared with the average of the previous ten years the number of deaths in 1942 was 1,000 fewer, and the notifications were 13,000 fewer.

Registrar-General's Quarterly Returns for Scotland

The vital statistics for Scotland for the first quarter of 1943 show very favourable figures. The birth rate of 18.9 per 1,000 was the highest recorded for a first quarter since 1932, and 101 above the average of the March quarters of 1938–42. Infant mortality was 75 per 1,000 live births: this was 21 below the average of the five preceding first quarters, and was the lowest recorded for the first quarter of any year. The previous lowest rate was 80 in 1938. The number of stillbirths was equivalent to a rate of 39 per 1,000 total births. Maternal mortality was 4.3 per 1,000 live births, or 0.7 below the five-year average for this quarter.

The general death rate was 14.4 per 1,000, being 2.6 below the average of the five preceding first quarters. On only two occasions has a lower death rate been recorded for a first quarter—i.e., 14.3 in 1943 and 14.2 in 1938. The death rate from all forms of tuberculosis was 82 per 100,000 and that from respiratory tuberculosis 63. Both these rates are 4 below the five-year average. The number of deaths from the principal epidemic diseases was 22 more than in the first quarter of 1942, but the rate of 35 per 100,000 was considerably below the average of 88 recorded for the first quarters of 1938–42. Deaths from diphtheria and cerebrospinal fever were 40 and 31 fewer than in the first quarter of 1942, but those from measles, whooping-cough, and influenza were 19, 29, and 48 more.

The boom in marriages after the outbreak of war is declining. The marriage rate during the quarter was 7.5 per 1,000. This is 2.8 below the rate for the corresponding quarter of 1942 and is the lowest wartime marriage rate recorded for any quarter, but is 1.1 above the average for the five pre-war years, 1935–9.

The Week Ending June 5

The notifications of infectious diseases in England and Wales during the week under review included: cerebrospinal fever 79, diphtheria 630, dysentery 125, measles 7,668, acute pneumonia 768, scarlet fever 1,921, whooping-cough 2,144, typhoid 4, paratyphoid 6.

No. 21

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 29.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943					1942 (Corresponding Week				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	80	6	21	1	1	146	6	48	3	5
Deaths		2	—				1	2		
Diphtheria	712	46	180	73	30	636	29	161	44	27
Deaths	24	1	2	—	—	16	—	4	1	3
Dysentery	116	13	50	—	—	110	8	50	—	—
Deaths	—	—		—	—	—	—	—	—	—
Encephalitis lethargica, acute	1	—	—	—	—	4	—	1	1	—
Deaths	—	—				—	—			
Erysipelas			49	10	2			54	8	5
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				19					28	
Deaths	33	8	7	9	6	37	5	8	7	4
Measles	7,395	429	509	27	40	7,195	807	990	66	374
Deaths	6	—	—	—	—	9	3	7	1	—
Ophthalmia neonatorum	88	3	16	1	—	92	10	11	1	1
Deaths										
Paratyphoid fever	10	—	—	—		5	—	4		
Deaths	—	—	—		—	—	—	—		—
Pneumonia, influenzal*	760	41	12	3	5	861	29	8	6	5
Deaths (from influenza)	13	2	2	—	—	12	—	1	1	—
Pneumonia, primary			211	23				291	42	
Deaths		—		11	12		—		11	15
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	3	—	—	3	—	5	—	—	—	—
Deaths		—	—				—	—		
Puerperal fever		5	16				1	20		
Deaths		1					—			
Puerperal pyrexia†	158	16	14	3	3	153	9	31	2	3
Deaths										
Relapsing fever	—	—			—	—	—			
Deaths										
Scarlet fever	1,997	167	268	38	51	1,091	48	200	36	13
Deaths	3	—	—	1	—	1	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhoid fever	5	1	6	8	2	4	1	3	8	—
Deaths‡	1	—	—	—	—				—	—
Typhus fever	—	—	—	—	—	—	—	—	1	—
Deaths			—	—	—			—	—	—
Whooping-cough	2,233	115	227	43	41	1,103	113	103	52	5
Deaths	9	2	4	—	1	8	1	2	2	—
Deaths (0–1 year)	336	40	65	27	26	299	38	57	33	25
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	4,202	590	569	210	133	3,859	541	574	193	140
Annual death rate (per 1,000 persons living)			12·8	13·8	§			12·9	12·9	§
Live births	6,767	870	927	401	314	5,835	687	954	411	300
Annual rate per 1,000 persons living			18·9	26·4	§			19·7	27·4	§
Stillbirths	201	22	33			206	20	40		
Rate per 1,000 total births (including stillborn)			34					40		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales, Eire, and Northern Ireland.

‡ Includes paratyphoid fever for England and Wales and London (administrative county).

§ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Medical News

The names of four Canadian medical men were omitted from the list of Birthday Medical Honours published last week at p. 734. Dr. James B. Collip, F.R.S., F.R.C.P., Professor of Biochemistry in McGill University, Montreal, and President of the Royal Society of Canada, was awarded the C.B.E. (Civil); Dr. William J. P. MacMillan of Charlottetown, Prince Edward Island, the O.B.E. (Civil); and Dr. William K. Colbeck of Welland, Ontario, and Dr. Paul C. Laporte of Edmundston, New Brunswick, the M.B.E. (Civil).

Mr. R. Watson-Jones has accepted the invitation of the London Hospital to join the honorary staff as director of the new accident and orthopaedic department which it is proposed to set up. Mr. Watson-Jones will take up his new post on Oct. 1.

A meeting of the London Association of the Medical Women's Federation will be held in the Lounge of B.M.A. House on Wednesday, June 23, at 8 p.m. for a discussion on "State Nurseries: Their Possibilities and Problems." The speakers will be Dr. G. I. Brodie, Mrs. Enthoven, Dr. Marjorie Back, and Dr. Katherine Hirst.

At a meeting of the Middlesex County Medical Society to be held at Grange Park School Clinic, Lansbury Drive, Hayes, on Wednesday, June 23, at 3.30 p.m., there will be a visit to a day nursery followed by a demonstration by the children. Dr. Back will speak on day nurseries, summarizing county experiences. Dr. Wright will describe work done at the school clinic, and the film on modern control of scabies will be shown. Visitors, especially members of the American and Canadian Forces, will be welcome.

National Baby Week, July 1 to 7, is the week in the year when the National Baby Welfare Council (24, Gordon Square, W.C.1) asks particularly that public attention should be focused on the nation's babies.

On the afternoon of Thursday, July 8, the President of the Royal Institute of Public Health and Hygiene will present the Harben Medal to Sir Henry Dale and the Smith Award to Dr. James Fenton.

A national conference on maternity and child welfare, arranged by the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality on behalf of the National Council for Maternity and Child Welfare, will be held at Friends House, Euston Road, N.W., on July 8 and 9, under the chairmanship of Dr. Stella Churchill. A clinical course for medical practitioners is being arranged by the Maternity and Child Welfare Group of the Society of Medical Officers of Health on the morning and afternoon of Saturday, July 10. Particulars may be had from Miss M. R. Lovelock, 117, Piccadilly, W.1.

Scabies in the County of London becomes compulsorily notifiable from Aug. 1 next. While the existing regulations have done much to counteract the spread of the disease in most parts of the country, it has become evident that in the metropolitan area compulsory notification would help to bring it under effective control and to remedy the conditions which conduce to it.

The New York Academy of Medicine, in co-operation with the State Department of Health, the City Department of Health, and six of the leading voluntary organizations in the fields of maternal welfare and child health, celebrated on February 19 the hundredth anniversary of the publication by Oliver Wendell Holmes of his paper entitled "The Contagiousness of Puerperal Fever."

Early diagnosis and treatment of congenital syphilis were the subjects of two resolutions adopted at a meeting on May 24 of the executive committee of the National Association of Maternity and Child Welfare Centres. In the opinion of the committee the physical and social disadvantages to a child with congenital syphilis are such that everything practicable should be done to diagnose the condition at the earliest possible time, including the routine application of the Wassermann, Kahn, or other tests to the mother's blood during pregnancy, in order that effective treatment may be given. Secondly, the Ministry of Health should give practical effect to this by propaganda, and by stimulating welfare authorities, voluntary hospitals, and clinics.

Drs. F. T. Ingham and R. M. B. Lowis have been officially reported interned, Singapore, and Dr. R. B. MacGregor, Malayan Medical Service, is a prisoner in Japanese hands at Changi Camp, Singapore. Prof. D. E. C. Mekie, F.R.C.S.Ed., has been interned in Changi Camp, Singapore. Dr. Ian Mackintosh of Kuala Lumpur has been officially reported a prisoner of war in Japanese hands. Dr. W. R. Duff of Taiping, F.M.S., is officially reported interned in Changi Camp, Singapore. Dr. C. A. Gibson-Hill has been reported interned in Singapore. Dr. W. J. Tyson, Colonial Medical Service, Drs. F. V. Jacques, R. G. S. MacGregor, and R. A. Macnab have been officially reported interned at Singapore.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Keeping A.P.T. Cool and Upright

Q.—*Why is it necessary to keep bottles containing A.P.T. for diphtheria immunization (1) upright, and (2) in a cool place? What is the definition of cool? It is not easy to carry such bottles on one's rounds and comply with either instruction, and even the surgery does not provide a place which is always cool.*

A.—1. Rubber used for caps and stoppers is a mixture, and different samples of rubber may be of widely different composition. Some rubbers react rapidly with the antiseptic (usually merthiolate) in A.P.T. Though the immunizing value of the A.P.T. may thereafter be but little reduced, the antiseptic is partly or wholly neutralized—with the obvious risk of bacterial growth in the A.P.T. if contaminated during re-use. All rubbers react rapidly at a tropical temperature, slowly in an English climate. It is therefore prudent to reduce contact between the rubber and the fluid to a minimum: hence the manufacturer's advice to store the bottle upright. In most doctors' bags carried during visits it should not be difficult to arrange the bottle in an upright position. If this is not possible, the risk of reaction in the English climate is very small, and A.P.T. issued by responsible manufacturers in rubber-sealed bottles would probably be safe for at least a year. Any reaction would show itself by brownish-black discoloration of the under surface of the stopper or of the fluid. If such discoloration becomes visible through the glass wall, the doctor would be wise to return the bottle at once to the supplier.

2. Almost all sera, prophylactics, and vaccines deteriorate at high temperatures. Since A.P.T. goes to all parts of the world, the advice to keep it in a cool place is obviously cogent for tropical stations. At about 65° F., the temperature of an average room in England, deterioration is very slow. If the bottle is not exposed to real heat —e.g., near a fire or on the floor of a car immediately over the engine on a hot day—A.P.T. will be of satisfactory immunizing power for at least a year and probably two.

Site for Intramuscular Injection

Q.—*The most common site chosen for intramuscular injection seems to be the gluteal region, in spite of certain difficulties and dangers associated with injection into this area. The deltoid and pectoral regions seem to present fewer difficulties. Is there any good reason why more use is not made of these accessible areas?*

A.—Both regions mentioned may be used for intramuscular injection, the main disadvantages being the small bulk of muscle, the inconvenience of persistent soreness in this situation, and the danger of damaging the circumflex nerve. The erector spinae muscle has also been used. The tendency nowadays, however, particularly in the case of the sodium salts of the sulphonamide drugs, is to choose the antero-lateral aspect of the thigh (vastus externus) as the least dangerous site for intramuscular injection.

Analysis of a Hair Preparation

Q.—*A patient of mine is suffering from chronic agranulocytosis, of which I am trying to find the cause. Among other things she has been using a proprietary application for the hair. Have I any power to compel the manufacturers to tell me the ingredients of this preparation?*

A.—The doctor cannot, unfortunately, compel the manufacturers to disclose the composition of the application. He can ask them to give him that assistance *ex gratia*, but they would be likely to refuse, partly because they would be unwilling to disclose a trade secret, and partly because they would wish to avoid giving information which might be used against them in an action for damages. The

doctor could not, without the patient's special authority, promise that she would not sue them, and she would be reluctant to waive a right which she might possibly need. If she were bringing an action against them, the court might conceivably grant her leave to administer an interrogatory concerning the composition of the substance; and if the substance is "recommended as a medicine" its composition ought to be disclosed on the bottle (Pharmacy and Medicines Act, 1941, 5, 11). These two possibilities, however, do not help the doctor; but he should not find it difficult to get an analyst's report.

Hypopituitarism, Hypogonadism, Anaemia

Q.—*I have a patient about whom I would welcome suggestions. A man of 50 who has been a farm labourer all his life, he is well covered, but has a parchment-like skin, is childish, and shows signs of infantilism (high voice, small genitals, no beard, and no pubic hair). His intelligence appears to be normal. He has an anaemia (Hb 42%) of an aplastic type unresponsive to massive iron therapy. I am about to embark on liver therapy unscientifically to "stimulate" his marrow. I have never heard of a similar syndrome and would welcome some information.*

A.—Cases of the type described are not excessively infrequent and are often difficult to classify or treat. A group of cases of hypopituitarism associated with achlorhydria and anaemia has been reported by Snapper, Groen, Hunter, and Witts,[1] and two more cases by Witts.[2] In these patients the sequence of events was thought to be pituitary insufficiency → atrophic gastritis → dyshaemopoietic anaemia. The anaemia was of either the hypochromic or the megalocytic type, and responded to iron or liver accordingly. Anaemia with hypogonadism may also occur in dystrophia myotonica and late coeliac disease, but neither of these diagnoses seems likely in the case presented. The most probable diagnosis is anaemia of the aplastic or hypoplastic type directly due to the endocrine defect. Cases of this type are mentioned by Bomford and Rhoads in their important paper on refractory anaemia[3] and have been seen by the writer. Here the sequence is probably pituitary disease → hypogonadism → aplasia of the marrow. Treatment with testosterone propionate, 25 mg. intramuscularly thrice weekly, is well worth trying. If this fails, the patient will probably get along with a large transfusion (1,500 to 2,000 c.cm. packed red cells) at fairly long intervals.

REFERENCES
1 *Quart. J. Med.*, 1937, **6**, 195.
2 *Lancet*, 1942, **2**, 307.
3 *Quart. J. Med.*, 1941, **10** 175

Treatment of Leucodermia

Q.—*Is there any recent advance in the treatment of leucodermia which holds out reasonable prospect of a cure?*

Q.—*I would be grateful for the following information: (a) The aetiology of vitiligo (leucodermia). (b) Is there any modern successful treatment of this condition? (c) Can the condition be inherited? I have a patient aged 24 years suffering from the disease. He feels that a holiday in the sun improves it temporarily, but only on his return home, and not at the time of the vacation. Is this likely? Finally, is suprarenal extract of any avail, and, if so, in what dosage?*

A.—The aetiology of leucodermia remains obscure, so that no rational treatment is known. Recently clinical improvement has been claimed after local treatment with Grenz rays, and this form of irradiation is worth a trial. Otherwise the areas might be rubbed with oil of bergamot and exposed to sunlight, or, for cosmetic purposes, painted with permanganate or with walnut juice. Oil of bergamot sensitizes the skin to sunlight, and some success is claimed for the intradermal injection of gold salts, which presumably act in the same way. This method of treatment lends some support to the view that leucodermia is a local functional disorder of pigmentation which may be corrected by certain stimuli. The effect of a stimulus may not be immediately apparent, and so the benefit of sunshine in vitiligo is usually a late phenomenon. Endocrine preparations of the suprarenal, pituitary, and ovary have all been tried with little result, but as the new fractions are isolated and become available they may be tried experimentally. No guide as to dosage can be given. Rarely leucodermia occurs in several generations, but the majority of cases have no family history of the affection.

Horner's Syndrome after Birth

Q.—*A child was born with blue asphyxia. The cord was tight round the neck, and the result was paralysis of the cervical sympathetic (slight ptosis, myosis, and enophthalmos). The child is now one year old with slight improvement. What is the prognosis? Is there any treatment?*

A.—There is no treatment for a Horner's syndrome of slight ptosis, myosis, and enophthalmos. The condition does not cause any disability, and the asymmetry is likely to become less marked as time goes on. The enophthalmos is more apparent than real, and is really only suggested by the smaller palpebral fissure. As the child gets older there will be compensatory action by the third nerve innervating the levator palpebrae superioris, and also by the frontalis muscle; the ptosis, which is easily overcome by voluntary power, will hardly be noticed. The myosis is unlikely to change much.

Management of Sterile Partners

Q.—*A young healthy woman with a healthy husband married two years ago. She has for economic reasons avoided or prevented pregnancy. She and her husband now wish to have a child, but without success. What is the best advice on treatment to give them?*

A.—The partners in this case should not be considered infertile until two years after they have abandoned the practice of contraception. Until such a time has elapsed no special investigations are necessary. A clinical examination of both husband and wife should be carried out, and if lesions such as underdeveloped testes, retroversion, etc., are excluded they should be reassured. They should be advised against overwork, anxiety, and either too frequent or infrequent coitus. It should be explained to them that the optimum time for conception is the eighth to the eighteenth days of the cycle, and that during this period coitus should be practised every two or three days. A vaginal douche of 1% sodium bicarbonate fifteen to thirty minutes before coitus often facilitates conception, either by softening the cervical mucous plug or by altering the *p*H of the vagina. If after two years there is still no sign of conception, then the case should be investigated fully. It is of the utmost importance that good general health on the part of either the husband or wife should not be accepted as indicative of adequate function on the part of their sex organs.

The semen of the husband, collected preferably by masturbation into a clean dry glass container, should be sent to a pathologist experienced in spermacytology. Undue delay in transit should be avoided if possible, and during transit the specimen should be kept at atmospheric temperature or colder. Heat is to be avoided. A simple examination of a hanging-drop preparation is not sufficient, and a knowledge of semen volume and of sperm density and morphology is necessary to assess male fertility. Huhner's test is useful in some cases. This consists in removing specimens from the cervical canal and from the vagina shortly after coitus, to study the effect of the vaginal environment on the spermatozoa and to see whether the spermatozoa are able to penetrate the cervical plug.

Investigation of the woman requires the services of a gynaecologist, and will involve dilatation of the cervix, endometrial biopsy to determine ovarian function, a tubal patency test either by air or CO_2 insufflation, or uterosalpingography, or both. Estimation of the *p*H of the vagina and cervix may help, but the latter is difficult. The treatment will necessarily depend on the results of investigations, but if the findings are all normal it is to be expected that the dilatation of the cervix and the insufflation will of themselves prove of great therapeutic value. This they do by ensuring better drainage of the cervix, thus preventing the mucous plug from becoming so inspissated as to form an impenetrable barrier to spermatozoa.

LETTERS, NOTES, ETC.

Sterility and Contraception

Mr. V. B. GREEN-ARMYTAGE writes: At first sight it would seem remarkable that the president of the Family Planning Association should advocate the study of sterility in clinics hitherto used for birth control. But maybe this worthy change of heart is not really so paradoxical, for it is gradually being recognized by the public and profession alike that scientific proof now exists for the statement that not less than one-third of the recipients of chemical and mechanical means of contraception in the early months or years of matrimony are eventually and consequentially the complainants of primary sterility. For these the prognosis is by no means so rosy whatever the degree of skill or advice obtainable.

Contaminated Injection

Dr. MALCOLM ALLAN (medical officer of health, Willenhall, Staffordshire) writes: Referring to your annotation in the *Journal* (May 15, p. 608) on the above subject, I found two 25-c.cm. bottles of diphtheria toxoid, alum-precipitated (preservative: orthochloromercuri-phenol 1:10,000), which contained a few c.cm. of prophylactic and had not been used for six months. When turned upside down fluid escaped through the rubber caps, and the bottles had been stored in a dusty centrally heated room. I sent both bottles to the laboratory, and the report was in each case: Direct film, no organisms seen; cultures, no growth aerobically or anaerobically.

Tetanus

Dr. E. FISHER (West Wyalong, New South Wales) writes: Referring to Dr. Leslie Cole's paper on tetanus (Nov. 7, 1942, p. 550) I would like to mention that in three cases of tetanus which I have treated the earliest symptom complained of was a feeling of tightness in the upper part of the chest, and tenderness on pressure over the tendons of origin of the sternocleidomastoid muscles. In one instance the patient said he felt as though he had a band around his chest.